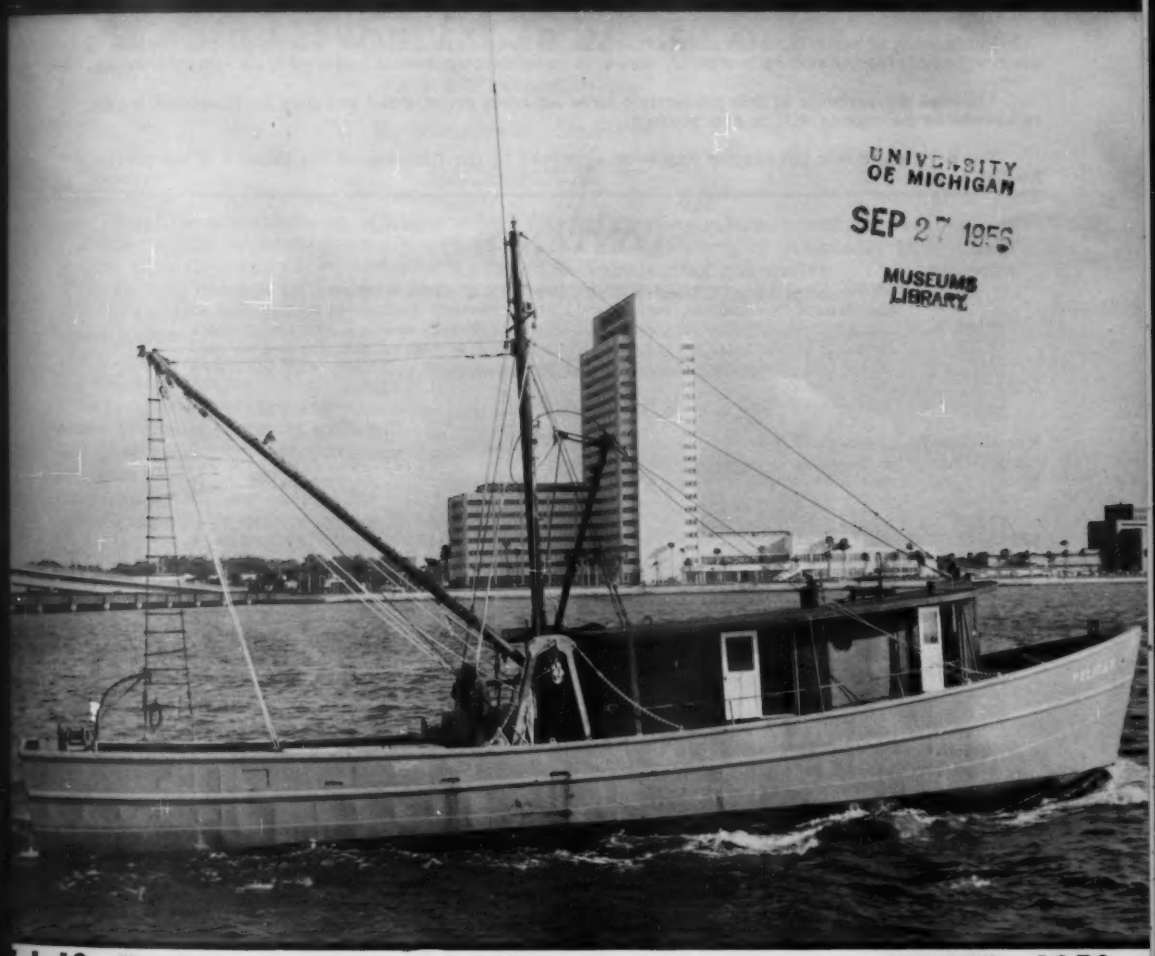
DIV. OF FISHES

COMMERCIAL FISHERIES REVIEW



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Vol. 18, No. 8 AUGUST 1956

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, DIRECTOR

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/31/57)

CONTENTS

COVER: The Pelican, specially rigged for deep-water trawling, is exploring for shrimp off the coasts of the Carolinas, Georgia, and Florida. Recently chartered by the U. S. Fish and Wildlife Service, the 73-foot steel-hulled vessel is primarily seeking a commercial supply of shrimp in deep water, but the explorations also may provide valuable data on other species of fish. (See Commercial Fisheries Review, April 1956, p. 23 and p. 48 of this issue.)

	Page
New Products from Fish Oils, Part I - Introduction, by Maurice E. Stansby	1
"Brown-Spotting" in the Southern Oyster, by Milton Fingerman	4
Fishery Tariff Concessions in 1956 Geneva Negotiations, by A. M. Sandberg	6
RESEARCH IN SERVICE LABORATORIES:	14
Fish-Quality Deterioration Study	14
Study of Drip in Frozen Fish	14
Antioxidant Mixtures for Preserving Fishery Products	15
TRENDS AND DEVELOPMENTS:	16
Additions to the Fleet of U. S. Fishing Vessels	16
Arkansas:	
Fish and Rice Crops	16
California:	
Periodic Flights Continued to Study Pelagic Fish Distribution (Airplane Spotting Flight 56-4)	17
Catch of Shrimp Beam Trawl Nets of Various Mesh Sizes Studied by M/V N. B. Scofield (Cruise 56-B-1)	18
Cans--Shipments for Fishery Products, January-April 1956	19
Electronic Devices Utilized in Fishery Research and Management	19
Federal Purchases of Fishery Products:	
Fresh and Frozen Fishery Products Purchased by the Department of Defense, May 1956	22
Quartermaster Canned Salmon Requirements from 1956 Pack	22
Films:	
Fishery Films Selected for International Film Festival	23
Fish and Wildlife Motif on United States Postage Stamps	24
Fish and Wildlife Service:	
New Research Laboratory to Study Problems of Gulf Fisheries	25
Florida:	
Fisheries Research, January-March 1956	25
TRENDS AND DEVELOPMENTS (Contd.):	
Great Lakes:	
Electrical Weirs to Control Sea Lampreys Must Remain in Operation Eight Years	27
Great Lakes Fishery Investigations:	
Fishery Study of Saginaw Bay Initiated by M/V Cisco (Cruise 1)	27
Chub Populations in Lake Huron Studied by M/V Cisco (Cruise 2)	28
Gulf Exploratory Fishery Program:	
Deep-Water Red Shrimp Commercial Potential Being Explored M/V Oregon (Cruise 39)	29
Food Irradiation Sterilization Pilot Plant	30
Maine Sardines:	
Canning Costs Increase	31
Canned Stocks, June 1, 1956	31
Market Outlook for Fishery Products	32
North Atlantic Fisheries Exploration & Gear Research:	
Smaller Catches of Deep-Water Ocean Perch Made at Edge of Continental Shelf by Delaware (Cruise 20)	33
Sea Scallops Sought in Deep-Water and Groundfish Samples Collected (M/V Delaware, Cruise 21)	33
Midwater Trawl Fishing-Depth Control Found Feasible by M/V Delaware (Cruise 22)	34
Marketing Prospects for Edible Fishery Products, July-September 1956	35
North Atlantic Fisheries Investigations:	
Haddock Eggs and Larvae Distribution Survey Continued by Albatross III (Cruise 76)	36
New Fisheries Research Vessel Shakedown Cruise (T-79, Cruise 1)	36

Contents Continued Page 111.

COMMERCIAL FISHERIES REVIEW

August 1956 Washington 25, D.C. Vol. 18, No. 8

NEW PRODUCTS FROM FISH OILS

Part 1 - Introduction

By Maurice E. Stansby*

BACKGROUND

Fish oils are made up of components having an unusual chemical structure. The fatty acids occurring as glycerides are, in a large part, of unusually long-chain length, with C_{20} and C_{22} chains being found in substantial quantities. The presence of these long chains makes possible the occurrence, again in substantial quantity, of fatty acids containing an unusually high number of double bonds, with as many as six being not uncommon. Such long-chain polyunsaturated fatty acids are also found in animal and vegetable oils, but the quantity present is of very small magnitude. In fish oils, sufficient quantities occur as to make commercial utilization feasible, should there be sufficient demand for compounds of such structure.

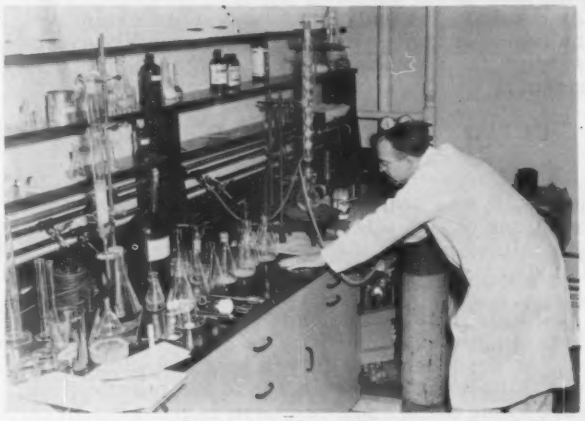

Fig. 1 - Preparation of derivative of fish oil for use as collector in iron-ore flotation.

In the past, very little consideration has been paid to the presence of these unique chemical characteristics of fish oils. Rather, the bulk of the fish oil has been sold on the basis of its general properties, usually as a substitute--all too often as a cheaper substitute--for animal or vegetable oils. Many times, the high degree of unsaturation, rather than being an asset, is a liability which causes a decrease in market value. Because fish oils are subject to odor reversion, when used as a substitute for other oils, such properties cause the fish oils to be sold at lower prices. Only a very limited portion of the fish oils sold has been used so as to take advantage of these unusual and highly specific chemical properties.

Byproducts of the meat industry include oils and fat which for many years were in the same category as fish oils so far as making use of special chemical characteristics is concerned. Within the past decade, a considerable amount of research on the part of the meat industry has greatly increased the profits realized from the byproducts. As a result of this research, a large number of chemical products are now made from meat-packing waste. The importance of this development to the meat-packing industry was pointed out in an article in Chemical Week (Anonymous 1954). One large meat-packing concern realizes 78 percent of its total profits from

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these byproducts, although the byproducts represent only 15 percent of total sales.

RESEARCH ON FISH OILS

Before fish oils can be utilized extensively as a source of chemicals, making use of their content of unique chemical groupings, a considerable amount of basic research must be carried out. This research must first show exactly what the chemical structures of fish oils are and then must show which reactions of the unsaturated long-chain fatty acids will produce useful chemical compounds. The type and amount of basic research required is so extensive that there is little likelihood that it can be carried out either in laboratories of the fishing industry or of the Government. Considerable fundamental research, especially in university laboratories, is needed before any extensive practical applications can be feasible.

It is sometimes hard to understand why more basic research has not been carried out in the past on fish-oil fatty acids. One reason is undoubtedly the fact that these fatty acids are very unstable and exceedingly difficult to work with. Another barrier to much research has been the fact that the pure unsaturated fatty acids of the long-chain lengths have not been available commercially and would have to be isolated from the fish oils by the laboratory carrying out the research. The importance of the ready availability of the fatty acids is shown by the fact that with such fatty acids as oleic, linoleic, linolenic, and arachidonic, which are available for purchase, research has been more extensive. When it is also considered that the fish oils themselves are not so readily available as oils such as linseed or cottenseed, the reasons why research on fish-oil fatty acids has been limited are apparent.

INITIAL WORK AT SEATTLE FISHERY TECHNOLOGICAL LABORATORY

In discussions over a period of years with technical members of the fishing industry, it was unanimously agreed that research as to the chemical properties and reactions of fish oils was a potentially fruitful field. Because of the exceedingly specialized nature of this field and the need for highly-qualified organic chemists and special expensive equipment, little more than discussions developed.

Early in 1953, the Seattle Laboratory of U. S. Fish and Wildlife Service decided that, in spite of the difficulties of this field of research, some attempt to obtain and publish research results was long overdue. A very small-scale program was therefore initiated to explore some of the possibilities. It was realized that considerable work along these lines had been carried out in chemical laboratories of some oil processors. Since, however, these results had, for the most part, never been published, they were not available either as a starting point for the present research or as a guide to fish-oil producers to indicate the value and potential use of their products. It was therefore necessary to repeat much relatively elementary work which undoubtedly had already been carried out but which had never been published.

In this early work, the Seattle Laboratory made extensive use of part-time graduate organic chemistry students from the University of Washington. This made possible considerable research work in the field of organic chemistry without exceeding the limited budget available. Much of this work was exploratory rather than specific. Reactions of unsaturated fatty acids described in the literature were tried, first with pure fatty acids, then with mixed fish-oil fatty acids. At least partial fractionation of the fatty acids was needed since otherwise it was impossible to identify the reaction products in the complex mixture of fatty acids obtained from the saponified fish oils.

It was realized from the start that the extent of research needed was so great that the small amount which could be carried out in Fish and Wildlife Service

laboratories under the limited regular budget would make almost imperceptible progress toward solving the problems. It was hoped rather that if a few publications on fish-oil chemistry could be made available, other laboratories, especially in universities, might be interested to enter this field of research.

The chance to get such expanded work under way came much sooner than anticipated. As a result of the funds provided by the Saltonstall-Kennedy Act of 1954, research contracts were let in 1955 for work on fish oils at a considerable number of universities. This Fish and Wildlife Service program then was transferred from a limited local project of the Seattle Laboratory to one of nationwide scope. In the resulting expansion, it was necessary to reorient the research program on fish oils at the Seattle Laboratory.

PRESENT PROGRAM AT SEATTLE LABORATORY

One of the primary responsibilities of the Seattle Laboratory, under the expanded oil-research program, has been the coordination of research on oils at those laboratories west of the Mississippi River which participate in Fish and Wildlife Service programs. These programs include several basic ones at Hormel Institute of the University of Minnesota on the chemistry, composition, and reactions of fish oils; and one at the University of California, Food Technology Department, on oxidative deterioration in fishery products. Several other contract research programs on applied research on fish oils are also included. Work at the Seattle Laboratory has thus taken on a new aspect in addition to the research begun earlier. It has been necessary to carry out considerable work in connection with providing authentic fish-oil samples for use by the various contract research laboratories. In some cases, it is necessary to extract and prepare the oils in the laboratory. Other activities involve reviewing the programs and seeing that information found by one laboratory which might be helpful to another is promptly made available.

To adequately coordinate these highly-specialized programs, considerable first-hand knowledge of the research is needed if optimum results are to be obtained. For this reason, some of the research started under the initial program when it was a purely local project has been continued at Seattle. Projects already under way have been pushed toward conclusion. Work will be continued in important fields not covered by existing contracts with other laboratories. One such field is concerned with fractionation of fatty acids from fish oils into fractions containing compounds of similar properties. Such fractionation will be needed in order to utilize fish oils as a source of new chemical compounds. Several methods are available, but not enough is known about their relative advantages and disadvantages. One paper (Domart, Miyauchi, and Sumerwell 1955) covering work done at this laboratory on urea fractionation of fish-oil fatty acids has already appeared. Another one describing a new urea-countercurrent-distribution method for fish-oil fatty-acid fractionation is in preparation.

Subsequent papers in this series will be concerned with either (1) reporting the early survey studies carried out at the Seattle Laboratory on reactions of fish oils or (2) continuing research especially on separations of the component constituents of fish oils.

"BROWN-SPOTTING" IN THE SOUTHERN OYSTER[1/]

By Milton Fingerman*

The bodies of Atlantic Coast oysters are normally creamy white except for some brown pigment deposited at the edges of the mantle. Southern oysters, in contrast, show varying degrees of body coloration from tan to deep brown. The pigment in tan oysters is homogeneously distributed over the mantle surface. Some brown pigment is also concentrated at the edges of the mantle and quite frequently on the portions of the mantle surrounding the adductor muscle. In "brown-spotted" oysters, the quantity of brown pigment is markedly increased. The pigment may be uniformly distributed throughout the outermost portion of the mantle or concentrated in restricted regions of the mantle. Experiments are currently in progress to determine (1) the nature and origin of "brown-spotting" in Southern oysters, (2) why some Southern oysters produce more "brown-spots" than others, and (3) why Southern, and not Northern, oysters produce "brown-spots."

Fig. 1 - Large plexiglass aquaria used for holding live oysters for physiological study of Southern oysters being conducted at Tulane University.

Histological sections of "brown-spotted" oyster tissues have been prepared. The "brown-spotting" appears to be restricted to epithelial cells of the mantle. The brown pigment may easily be scraped with a scalpel from the surface of a living oyster. The "brown-spotted" material has a mucoid appearance, probably due to the mucus always present on the oyster body surface. When observed with the microscope, this "brown-spotted" material appears to be composed of numerous golden-brown granules.

There is a positive correlation between the intensity of "brown-spotting" on the oyster body and the amount of purple or brown pigment deposited in the shell. The pattern of pigment in the shell is mirrored by the distribution of "brown-spot" on the body of the oyster. Shells have been sectioned in order to determine the pattern of purple and brown-pigment deposition. The pigments are usually found distributed in the prismatic and nacreous layers of the shell. When the pigment is found on the inner surface of the shell, in the nacreous layer, sectioning reveals that the coloration extends at least two to three millimeters into the prismatic layer from the inner surface of the shell. There may be deeper layers of pigment not associated with the inner layers of pigment, indicating the formation

Fig. 2 - Water bath with temperature control and stirrer. The kymograph to the right is for recording shell movements of oysters under test for reaction to higher temperatures.

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1/ This study was conducted under a contract between Tulane University and the U. S. Fish and Wildlife Service. It was financed with funds provided under P. L. 466, 83rd Congress, approved July 1, 1954 (referred to as the Saltonstall-Kennedy Act).

of "brown-spot" material need not be a continuous process. The presence of pigment throughout the shell suggests that "brown-spotting" first appears in oysters that are younger and smaller than those collected by commercial oystermen. Furthermore, if an imperfection in the form of a depression is present on the internal surface of the shell, the portion of the body lying immediately above the imperfection usually has brown pigment deposited in the form of an outline of the imperfection.

Body coloration of oysters from Delaware Bay and Chesapeake Bay was compared with Southern oysters. The Northern oysters showed no spotting nor was color evident on the shells to any extent except in the region where the adductor muscle attaches to the shell.

Experiments designed to induce spotting have not been successful. Oysters receiving implants of "brown-spotted" oyster tissue were placed in aquaria for a week when they were shucked and inspected for "brown-spot." Oysters were also maintained for one week in sea water containing homogenized "brown-spotted" oyster tissue. Neither group of oysters showed a significant increase of intensity of "brown-spotting." The lack of success of these experiments is further indication that "brown-spotting" is initiated early in the life of the Southern oyster.

FLYER USED IN INDUSTRY-GOVERNMENT SALES PROMOTION PROGRAM

SPECIAL FISHERIES BULLETIN

MARKETING

Department of the Interior Fish and Wildlife Service

TUNA

SUPPLIES are PLENTIFUL & ECONOMICAL

U.S. Government Suggests-"USE TUNA NOW"

The United States Department of the Interior, the Department of Agriculture, and the Tuna Industry, are encouraging the greater use of tuna. Canned tuna in oil will be included by the Department of Agriculture in its plentiful foods coverage during September. A highly nutritious protein food, canned tuna is available on a nation-wide basis at prices that are at their lowest level in years.

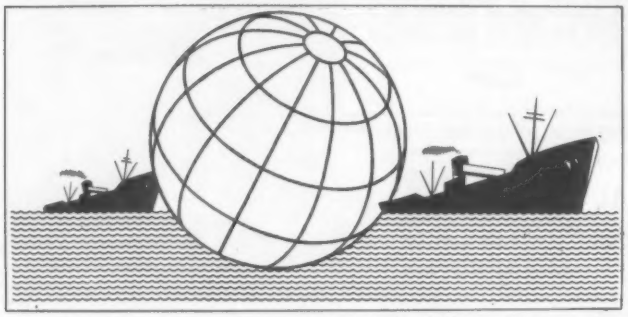
FISHERY TARIFF CONCESSIONS IN 1956 GENEVA NEGOTIATIONS

By A. M. Sandberg*

BACKGROUND

Trade agreement negotiations were completed by 22 countries, including the United States, during the conference which was held at Geneva, Switzerland, beginning on January 18, 1956, under the auspices of the contracting parties to the General Agreement on Tariffs and Trade. The 22 countries were: Australia, Austria, Belgium, Canada, Chile, Cuba, Denmark, Dominican Republic, Finland, France, Federal Republic of Germany, Haiti, Italy, Japan, Luxembourg, Netherlands, Norway, Peru, Sweden, Turkey, the United Kingdom, and the United States.

This conference was one of a series of multilateral meetings held since World War II for the purpose of exchanging reciprocal concessions on tariffs. These countries and others of the 35 countries which are parties to the GATT had also negotiated tariff reductions at earlier conferences held at Geneva (1947), Annecy (1949), Torquay (1950-51), and at Geneva in 1955, when negotiations were held for the accession of Japan to the GATT.



The United States obtained tariff concessions in these negotiations on overall exports valued at approximately $400 million. United States export trade will also benefit from additional concessions granted in the course of negotiations between other pairs of countries; the total value of these indirect benefits is not now available. Products on which concessions were obtained by the United States cover a wide range of agricultural and industrial products.

In direct tariff negotiations, concessions were obtained by the United States for certain fishery export commodities, including certain shrimp, salmon, and oyster products. A description of these concessions is contained in table 1.

In return for the concessions obtained, the United States granted concessions valued at $677 million in terms of United States imports of all commodities in 1954 from the country with which the concession was negotiated. Imports of the same items from other participating countries amounted to $134 million, thus bringing the total of benefits to all participants to $811 million.

Among the fishery items on which tariff concessions were granted by the United States were certain fish and fish-liver oils, shark and whale oil, isinglass, pearl essence, certain canned smoked sardines, antipasto, fish cakes, canned herring snacks and tidbits, mild-cured salmon, and certain unboiled caviar. A listing and further description of the items is given in table 2.

United States reductions were generally limited to reductions in duty of about 15 percent. In many cases, the reduction in duty exceeded the 15-percent limitation prescribed by the Trade Agreements Extension Act. The law permits minor

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additional reductions on items in order to simplify tariff rates. The rules for applying these additional reductions of "roundings" provide that such reductions may not exceed one-half of one percent ad valorem or its equivalent if the tariff is in such terms as cents per pound.

Table 1 - Fishery Items on which the United States Obtained Concessions from Other Countries, Geneva, 1956

Country and Tariff Item No.	Brief Commodity Description	Duty Status				Imports from the U. S., 1954 (US$1,000)
		Before Agreement		Under Agreement		
BENELUX						
ex 103	Menhaden oil	Free		Free		1,710
120a3A	Canned salmon *	20% 1/		15%		215
CANADA		To U. S.	B.P. 2/	To U. S.	B.P. 2/	
118c	Shrimp in sealed containers	15%	15%	10%	10%	1,171
ex 123(c)	Shrimp prepared or preserved	22½%	15½%	10%	10%	N.S.S.
ex 123(c)	Oysters, prepared or preserved	22½%	15½%	15%	15%	18
124	Oysters shelled in bulk	5¢ gal.	5¢ gal.	Free	Free	476
125	Oysters shelled in cans, not over 1 pt.	2½¢ can	1½¢ can	Free	Free	
126	Oysters shelled in cans, over 1 pt., not over 1 qt.	4½¢ can	2½¢ can	Free	Free	65
127	Oysters shelled in cans, over 1 qt.	4½¢ qt.	2½¢ qt.	Free	Free	
ex 133	Oysters shelled and frozen N.O.P.	17½%	12½%	Free	Free	3/ 147
ex 133	Shrimp fresh or frozen	12½%	12½%	10%	10%	3/ 642
ex 133	Shrimp peeled and deveined	17½%	12½%	10%	10%	N.S.S.
418	Fish meal machinery and parts	10%	Free	10%	Free	682
680a	Sponges of marine production	12½%	Free	Free	Free	33
JAPAN						
ex 324-1 031-0341	Shrimp, prawn, and lobsters, fresh shelled or frozen	10%		5%		11
NORWAY		Crowns Per Kilo				
141	Canned salmon	0.30		0.25		-
147	Salt salmon	0.30		0.25		3
UNITED KINGDOM		MFFN4/	Pref.	MFFN4/	Pref.	
3 GAV	Prawn and shrimp, canned	10%	Free	7½%	Free	3/ 6

1/ Duty currently suspended.
2/ The British preferential rate applies to imports from all countries of the British Commonwealth. The preferential shown is the lowest rate under Canada's preferential tariff.
3/ Trade based on United States export statistics.
4/ Most favored nation.
Abbreviations: N.O.P. - not otherwise provided, N.S.S. - not specifically specified in foreign trade statistics.

Other countries' concessions, on the other hand, were in many cases deeper than the 15 percent permitted under the United States negotiating authority. For example, almost 80 percent of Germany's concessions consisted of tariff reductions of 25 percent or more. Half of Canada's concessions to us were reductions of more than 21 percent, and on a few items there was even complete elimination of duties. On $13 million of United States trade, preferences were eliminated by Canada.

United States reductions will be put into effect in three annual stages in accordance with the provisions of the Trade Agreements Extension Act of 1955. The first of these stages was to enter into force on and after June 30, 1956; the next two stages are scheduled to become effective in each of the next two years, respectively. With few exceptions, other countries will put in effect all of their concessions at one time.

Public notice of intention to negotiate this agreement was given on September 21 and December 9, 1955. At the same time there were published lists of items on which concessions in United States tariffs would be considered. Interested parties were given opportunity to submit written briefs containing their views on concessions to be obtained and granted, and public hearings were held beginning October 31, 1955, and January 17, 1956, to obtain views from interested parties. The Committee for Reciprocity Information which conducted the hearings was made up of persons also members of the Interdepartmental Committee on Trade Agreements, which is the body formulating recommendations to the President on trade agreement matters. The information furnished in the written briefs and during the public

Table 2 - Fishery Items on which the United States Granted Tariff Concessions, Geneva, 1956

Tariff Par.	Stat. Class. (1956)	Brief Commodity Description	Rate of Duty				Negotiating Country	Total U. S. Imports, 1954 (US$1, 000)
			January 1, 1955	Geneva 1956 Agreement				
				1st Stage	2nd Stage	3rd Stage		
34	2220.250	Advanced in value: Shark-liver oil, including dogfish-liver oil	5% plus 1¢ per lb. IRC tax	4½% plus 0.95¢ per lb. IRC tax	4½% plus 0.9¢ per lb. IRC tax	4% plus 0.85¢ per lb. IRC tax	Japan	540
	2220.260	Shark oil including dogfish oil	"	"	"	"	"	14
	2220.270	Fish oils, n.e.s. (except cod oil and herring oil and not including whale oil)	5% plus ½¢ per lb. IRC tax	4½% plus 1.4¢ per lb. IRC tax	4½% plus 1.3¢ per lb. IRC tax	4% plus 1.25¢ per lb. IRC tax	"	2
	2220.300	Fish-liver oils, n.e.s. (except cod-liver oil)	"	"	"	"	"	1,629
1669	2210.920	Not advanced in value: Shark oil and shark-liver oil, including dogfish and dogfish-liver oil	Free plus 1¢ per lb. IRC tax	Free plus 0.95¢ per lb. IRC tax	Free plus 0.9¢ per lb. IRC tax	Free plus 0.85¢ per lb. IRC tax	"	-
	2210.980	Fish oils, n.e.s. (except cod oil and herring oil and not including whale oil)	Free plus 1½¢ per lb. IRC tax	Free plus 1.4¢ per lb. IRC tax	Free plus 1.3¢ per lb. IRC tax	Free plus 1.25¢ per lb. IRC tax	"	2
41	0941.700	Isinglass	25%	23½%	22½%	21%	United Kingdom	29
52	0803.000	Sperm oil, crude	1¼¢ per gal.	1.15¢ per gal.	1.1¢ per gal.	1¢ per gal.	Norway	804
	0803.500	Whale oil, n.s.p.f.	3¢ per gal. plus 1½¢ IRC tax	2.8¢ per gal. plus 1.4¢ per gal. IRC tax	2.7¢ per gal. plus 1.3¢ per gal. IRC tax	2½¢ per gal. plus 1¼¢ per gal. IRC tax	Canada	83
	0808.710	Shark oil, including oil produced from dogfish, n.s.p.f.	5% plus 1¢ per lb. IRC tax	4½% plus 0.95¢ per lb. IRC tax	4½% plus 0.9¢ per lb. IRC tax	4% plus 0.85¢ per lb. IRC tax	Japan	-
66	8420.270	Pearl essence	12½%	11½%	11%	11%	Norway	347
717(a)	0055.500	Swordfish, whole or beheaded or eviscerated	1½¢ per lb.	Bound at 1½¢ per lb.			Peru	1/ 161
717(b)	0060.320	Swordfish, filleted, skinned, boned or divided into portions	1½¢ per lb.	Bound at 1½¢ per lb.			Peru	1/ 118
717(c)	0062.250	Shark fins, dried and unsalted Product of Cuba	¾¢ per lb. ½¢ per lb.	0.59¢ per lb.	0.56¢ per lb.	0.53¢ per lb.	Japan Cuba	52 4
				Bound at ½¢ per lb.				
718(a)	0063.390 (part)	Sardines, smoked, in oil or in oil and other substances, neither skinned nor boned, valued over 30¢ per lb. including weight of immediate container (canned)	15%	14%	13½%	12½%	Norway	3,400 (est.)
	0063.340	Sardines, smoked, in oil and in oil and other substances, neither skinned nor boned, valued over 18¢ but not over 23¢ per lb., including weight of immediate container (canned)	15%	14%	13½%	12½%	Norway	116
	0066.300	Antipasto, in oil or in oil and other substances, valued over 9¢ per lb. including weight of immediate container (canned)	15%	14%	13½%	12½%	Italy	170
	0066.700 (part)	"Other fish" in oil or in oil and other substances, valued over 9¢ per pound including weight of immediate container	30%	28½%	27%	25½%	Denmark	150 (est.)
		Note: Includes such products as canned smoked salmon, canned smoked sturgeon, canned sprats, fillet of mackerel, and numerous oriental specialties when packed in oil or in oil and other substances (does not include prepared fish sticks).						
718(b)	0067.300	Fish cakes, balls, and puddings not in oil or in oil and other substances, in airtight containers weighing with contents not over 15 pounds each	6¼%	5¾%	5½%	5%	Norway	178
	0067.720	"Other herring" (includes snacks, tidbits, rollmops, sprats) not in oil or in oil and other substances in airtight containers weighing with contents not over 15 pounds each (canned)	6¼%	5¾%	5½%	5%	Norway	1,971
	0067.800	Bonito in brine in airtight containers weighing with contents not over 15 pounds each (canned)	12½%	Bound at 12½%			Peru	547
719	0068.000	Pickled or salted salmon	10%	9½%	9%	8½%	Canada	68
721(d)	0079.200	Caviar (except sturgeon roe) not boiled and not packed in airtight containers, n.s.p.f.	5¢ per lb.	4¼¢ per lb.	4¼¢ per lb.	4¢ per lb.	Japan and Canada	87
775	1250.250	Pastes, balls, puddings, hash and similar mixtures of vegetables, meats or fish, n.s.p.f.	25%	23½%	22½%	21%	Italy	46
1538	0990.290	Shells and mother-of-pearl engraved, cut, ornamented or manufactured	17½%	16½%	15½%	15%	Japan	349

1/ Imports from Peru only, the concession is a rebinding of rates already bound in the General Agreement.
Abbreviations: IRC tax - Internal Revenue Can Tax. n.e.s. - not elsewhere specified. n.s.p.f. - not specifically provided for . est. - estimate.

hearing, as well as all relevant information available within the Government, and digests of confidential data and "peril point" findings prepared by the Tariff Commission on items under consideration were considered. Digests were prepared by the Departments of Commerce, Agriculture, and Interior on items for which the United States sought to obtain concessions. This material was studied first by interdepartmental subcommittees, then by the Committee on Trade Agreements, which formulated recommendations to the President at every stage of the preparations. No concession was offered without the President's approval, and the overall results were also subject to his approval.

The Department of the Interior participated in the preparation for these negotiations. Harry M. Shooshan, International Activities Assistant, Technical Review Staff, represented the Department of the Interior at the tariff negotiating conference, as well as on the Committee for Reciprocity Information and Trade Agreements Committee deliberations.

The nongovernmental advisers assigned by the President to attend the deliberations at the Geneva conference reported as follows to the President: "Having had an opportunity to observe at first hand the tariff negotiations now drawing to a conclusion at Geneva, we are happy to report to you that the interests of our country have been well served. We have been greatly impressed by the competence of the career men from the nine departments and agencies of the Government who have handled these important negotiations. The members of the Trade Agreements Committee, particularly, have worked long hours for many months with a high degreee of concentration and effort.

"We were particularly impressed with the unfailing concern of our negotiators to advance the broad interests of the United States. By no stretch of the imagination could the tariff negotiations, as we observed them, be called a give-away program. The entire program is, of course, based upon reciprocal concessions, and we found our negotiating teams and the Trade Agreements Committee to be bargaining in what seemed to us to be the best Yankee tradition. They insisted on obtaining concessions of full value for each concession made by the United States. There is great need for a better public knowledge of these facts."

TARIFF CONCESSIONS OBTAINED BY THE UNITED STATES IN DIRECT NEGOTIATIONS

In direct negotiations, the United States obtained from other countries concessions in their duties for certain fishery export commodities. These include various forms of shrimp, salmon, and oysters. Tariff concessions obtained by the United States from other countries were also scheduled to go into effect on June 20, 1956.

BENELUX CONCESSIONS ON MENHADEN OIL AND CANNED SALMON: A duty-free binding was obtained for menhaden oil. This product is also exempt from Netherlands monoply fees or corresponding Belgian-Luxembourg charges if imported for further processing. Benelux imports from the United States in 1954 were valued at $1,710,000.

The duty on canned salmon has been suspended for some time. The reduction in the statutory rate of duty from 20 to 15 percent was obtained. This provides that should the suspension of duty be lifted, the duty would revert to the 15-percent rate, rather than the higher rate.

CANADA IN CONCESSIONS ON SHRIMP, OYSTERS, AND SPONGES: The United States obtained direct tariff concessions from Canada which are of substantial value to the domestic shellfish industry. These negotiations resulted in the elimination of the margin between the preferential rates applying to countries of the British Commonwealth and those to the United States.

Duties were eliminated on shelled oysters and reduced on fresh, frozen, and canned shrimp. Canadian imports from the United States in these shellfish items totaled $2,519,000 in 1954. On fresh or frozen shrimp, the duty was reduced from 12½ percent to 10 percent ad valorem. According to United States export statistics, shipments of this product to Canada were valued at $642,000 in 1954 and $888,000 in 1955. On canned shrimp, for which United States export trade to Canada amounted to $1,188,000 in 1954 and $1,875,000 in 1955, the duties were cut from 15 to 10 percent.

Reductions were also negotiated in the duties on prepared and preserved and peeled and deveined shrimp. In the former case, the concession lowered the duty from 22½ percent to 10 percent, and in the latter from 17½ percent to 10 percent. Data on these products are not separately shown in the foreign trade statistics.

Duties on prepared and preserved oysters were reduced from 22½ percent to 15 percent. The duty of 5 cents a gallon on oysters shucked in bulk was eliminated as were the duties on shucked oysters in the can. The duties in the latter case were 2½ cents per can for cans not over 1 pint; 4½ cents per can for cans over one pint and not over one quart; and 4½ cents per can for cans exceeding one quart. The 17½ percent ad valorem duty on shucked and frozen oysters was also eliminated. United States oyster exports to Canada, which were valued at about $700,000 in 1954, will likely be increased as a result of the reductions in the various duties.

The Canadian import duty on marine sponges was reduced from 12½ percent to free status.

JAPANESE CONCESSION ON SHRIMP AND LOBSTERS: Japan's participation in the 1956 tariff negotiations at Geneva came eight months after the completion of the 1955 negotiations. In the postwar years, Japan consistently has purchased more merchandise from the United States than it has sold. This imbalance has been defrayed in large measure by special dollar earnings resulting from the expenditures by and for the United States Armed Forces in Japan. When these special dollar earnings cease, Japan will have to find other sources to compensate for them. In the interest of conserving foreign exchange for the purchase of essential commodities, Japan has exercised strict trade and exchange controls. In 1955, Japan's trade picture improved somewhat and the deficit in trade with the United States was reduced. As a result of this improvement, Japan partially relaxed some of its exchange restrictions.

The rate of duty for shrimp, prawn, and lobsters, fresh, chilled, or frozen was reduced from 10 percent to 5 percent ad valorem. Japanese imports of these products from the United States in 1954 totaled about $11,000.

NORWEGIAN CONCESSION ON CANNED AND SALTED SALMON: Norway granted a reduction of about 16 percent in its rate on canned salmon and salted salmon. The duty was reduced from 0.30 crowns per kilogram to 0.25 crowns. United States exports of salted salmon to Norway amounted to $3,000 in 1954. Trade in this item has been hampered by import restrictions but efforts are under way to seek liberalization. No trade was reported in 1955. Norway did not import canned salmon from the United States in 1954 and 1955.

UNITED KINGDOM CONCESSION ON CANNED SHRIMP: The United Kingdom granted a concession on canned shrimp (a reduction of 25 percent, from a duty of 10 percent ad valorem to 7½ percent). United States exports of canned shrimp to that country in 1955 were valued at $6,000. Trade in this item has been subject to import restrictions.

TARIFF CONCESSIONS GRANTED BY THE UNITED STATES

Concessions were granted to Japan on certain fish and fish-liver oils. The principal concessions granted Norway consisted of reductions in the duty on canned smoked sardines, crude sperm oil, and pearl essence. Our import duty on mild-cured salmon was reduced in negotiations with Canada. The United States duty on imports of swordfish and on canned bonito in brine were bound to Peru. The items negotiated with Peru were previously bound in trade negotiations with other countries but were granted to Peru in this negotiation by direct concession.

Our import-duty reductions will apply to imports into the United States from all free-world countries. The reductions will not apply to imports from the Soviet-dominated bloc.

CERTAIN FISH OILS AND FISH-LIVER OILS, PAR. 34, 52, AND 1169: The oils included in the concessions made by the United States are chiefly fish-liver oils (except cod, cod-liver, and halibut-liver oil), whale oil, and crude sperm oil. Small quantities of viscera and body oils are included. The principal oils are those obtained from the livers of the shark, including dogfish, and from the livers of tuna, swordfish, and other miscellaneous types of fish. Herring, menhaden, and pilchard body oils are not included.

Japan is the principal source of United States imports of fish-liver oils. United States total imports of the oils upon which concessions were made were valued at $2,188,000 in 1954 of which Japan supplied $2,055,000. In 1955, imports were valued at $2,034,000 of which $1,902,000 was supplied by Japan.

Production of shark-liver oil has declined in the United States from $937,000 in 1950 to $298,000 in 1954. Production of other fish-liver oils has also declined but their combined value probably well exceeds the value of the production of shark-liver oils. These natural vitamin oils also encounter sharp competition from synthetic vitamins.

PEARL ESSENCE, PAR. 66: Our rate of duty on pearl essence was reduced from 12½ percent to 11 percent in negotiations with Norway. United States imports of this product from all countries in 1954 totaled $347,000 and $250,000 in 1955.

PICKLED OR SALTED SALMON, PAR. 719: The United States granted a concession to Canada which will reduce the duty on canned mild-cured salmon from 10 percent ad valorem to 8½ percent. United States imports during 1954 had a value of $68,000 and during 1955 of $41,000.

SMOKED SARDINES:

In oil or in oil and other substances, neither skinned nor boned; valued over 30 cents per pound, including weight of immediate container Par. 718(a): Our rate of duty on smoked sardines, in oil or in oil and other substances neither skinned nor boned, valued over 30 cents per pound, including weight of immediate containers was reduced from 15 percent ad valorem to 12½ percent ad valorem in the negotiations with Norway. This concession is a part of an import classification which included similarly prepared sardines valued over 23 cents a pound. No concession was granted on the value bracket over 23 cents but not over 30 cents a pound. Norway has been the principal source of imports of the grade of sardines upon which the concession was made. United States total imports amounted to an estimated $3.5 million in 1954, and $4.5 million in 1955.

Domestic production of smoked sardines, comparable to the types imported (valued at over 30 cents a pound) is estimated as less than $15,000 annually.

In oil or in oil and other substances, neither skinned nor boned; valued over 18 cents per pound, but not over 23 cents including weight of immediate container: Our rate of duty on these products was also reduced. This merely provides for a similar rate of duty for smoked sardines valued over 30 cents a pound. The rate of duty on smoked sardines between 23 and 30 cents a pound was not changed by the negotiations and remains at 15 percent ad valorem. United States total imports of items coming within this class on which the concession was granted were valued at $116,000 in 1954 and $54,000 in 1955.

"OTHER FISH" IN OIL OR IN OIL AND OTHER SUBSTANCES, VALUED OVER 9 CENTS PER POUND: Our duty on these products was reduced by a concession to Denmark, primarily to benefit imports of canned sprats which are in certain cases classifiable under this tariff item. United States total imports of these products in 1954 were valued at about $150,000; in 1955 these imports were valued at $83,000.

"OTHER HERRING", NOT IN OIL OR IN OIL AND OTHER SUBSTANCES, IN AIR-TIGHT CONTAINERS, WEIGHING WITH CONTENTS NOT OVER 15 POUNDS EACH: Our duty for these products was reduced in a concession to Norway. This item includes such products as canned herring snacks, tidbits, rollmops, and sprats not in oil or other substances. United States total imports of these products in 1954 were valued at $1,971,000, and in 1955 at $2,022,000.

NO CONCESSIONS GRANTED ON CERTAIN LISTED ITEMS

A number of items listed for consideration for possible reduction of import duty were not subject to concessions. In some instances, no basis was found for granting concession; in others, peril-point findings precluded granting a concession. Among the items listed for public hearing on which no concessions were granted were sodium alginate, fish livers, refined sperm oil, fresh-water fish fillets, fresh or frozen sablefish, canned mackerel and jack mackerel, fish hooks, nylon gill-netting, pearl or shell button blanks, and natural pearls.

TARIFF CHANGES ON FISHERY ITEMS RESULTING FROM NEGOTIATIONS BETWEEN OTHER COUNTRIES

Many of the benefits derived from bindings or reductions of rates of duty which were negotiated between other countries will accrue to United States products exported to the country granting the concession. As a result of the "most-favored-nation" provision of the agreement, concessions granted by one party to any one of the others automatically are extended to all countries participating in the GATT.

Concessions made by other countries of interest to United States fishery industries included the following:

Canada - prepared or preserved mussels; fish hooks.

Norway - nylon fish nets.

United Kingdom - fish meal, fish hooks, fish-cutting machines, caragheen extracts.

Italy - dried cod and haddock, canned salmon, fish hooks.

West Germany - fish fillets, oysters, canned salmon, small herring, prepared or preserved lobster.

Principal fishery items included in the negotiations between other countries which are of interest to United States fishery interests are listed in table 3.

Table 3 - Tariff Concessions on Fishery Items Resulting from Third Country Negotiations, Geneva, 1956

Country and Tariff Item	Brief Commodity Description	Rate Under Agreement	Country and Tariff Item	Brief Commodity Description	Rate Under Agreement
Canada			Austria (Contd.)		
8c	Whale meat, for use exclusively in the feeding of fur-bearing animals or in the manufacture of feeds for such purposes	Free	99.05	Fishing nets machine-made of a length of more than 100 metres and of a width of more than 3 metres, for persons practising fishing as a profession under certificate of the Federal Ministry of Agriculture and Forestry	Free
133 Ex (c).	Mussels, prepared or preserved	17½ percent			
Ex 448j	Fish hooks, n.o.p.	10 percent	West Germany		
Norway			0301	Fish, live or dead, fresh, chilled or frozen:	
Ex 797	Nylon fishing nets	5 percent ad valorem but not less than kr. 2.00 per kg.		A. Fresh-water fish:	
				ex3 - Other than salmon and trout:	
United Kingdom				Eels:	
1 G.A.V.	Fish meal, other than herring meal	10 percent		From October 1 to 31	3 percent
				From January 1 to April 30	Free
2 XVIII(22) (3 1 V(5) (xiii)	Fish hooks	20 percent		Other fish, not including eels and carp	5 percent
				B. Sea fish:	
2 X (1)	Fish processing machines, skinning, gutting, opening, splitting, slicing, and cutting machines; head-, tail- and bone-removing machines	17½ percent		1. Whole or cut up, not including fillets:	
				ex c - Other than herring or sprat:	
				Haddock, ling, ocean perch, halibut, from August 1 to December 31	Free
				Plaice and flounder	5 percent
				2. In fillets	10 percent
1 G.A.V.	Carageen extract	10 percent			
Haiti			0303	C-2 Oysters (other than spat)	Free
Ex 12013	Fish and shellfish, not specified, dried	0.33 gourdes per kg. 20 percent ad valorem	1604	Prepared or preserved fish and fish products:	
Italy				1C. In hermetically sealed containers (canned):	
24b	Fish, simply salted, dried or smoked; codfish (baccala) or similar fish (haddock, kippfish, stockfish)	Free		a. Of the salmon family	20 percent
				d. Sprat (Clupea sprattus)	14 percent
156	Prepared or preserved fish in airtight containers			ex e. Herring, the live length not over 19 centimeters, in oil or tomato or both	14 percent
	Salmon (canned)	14 percent		Other, in containers of a weight of more than five hundred grams	20 percent
1340b	Fish hooks, including anchor type	12 percent		ex f. Eel, boiled, fried, or similarly treated, with added vinegar or aromatic herbs	20 percent
Austria				ex g. In other packings:	
16 04 Ex B-1-b	Fish, cooked or smoked, in sauces, mayonnaise, remoulade or in non-jellying liquids	220 schillings per 100 kgs.		Fish of the salmon family	20 percent
	Kippered herring (salted or smoked herring without any addition) in airtight containers (canned)	150 schillings per 100 kgs.		Sprat, herring, in containers of a weight of more than five hundred grams	20 percent
				Eel, boiled, fried, or similarly treated	20 percent
Abbreviations used - not otherwise provided.			Ex 1605	Lobster, prepared or preserved	20 percent

Note: Complete date on all tariff items negotiated in 1956 tariff negotiations and related information are contained in these U. S. Department of State publications for sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

1. General Agreement on Tariffs and Trade--Analysis of United States Negotiations--Sixth Protocol of Supplementary Concessions, Geneva, 1956 (State Department Publication No. 6348, Commercial Policy Series No. 158), $1.

2. General Agreement on Tariffs and Trade, Schedule XX (State Department Publication 6362, Commercial Policy Series 159), 60 cents.

SHRIMP--A FAVORITE AMERICAN FOOD

The glamorous shrimp continues to win favor with Americans.

Statistics released here April 18, 1956, by the Shrimp Association of the Americas in connection with the Eleventh Annual Convention of the National Fisheries Institute at Miami Beach, Fla., show that the United States is now consuming more than 350 million pounds (heads on) of shrimp a year, valued at $225 million ex-vessel, an increase of about ten percent a year.

"Americans are now consuming shrimp at the rate of two pounds per capita," Manny Sanchez, Brownsville, Tex., president of the Shrimp Association declared. "Our shrimp products, once classified chiefly in the cocktail category, are rapidly moving into the main-dish area on Americans' menus.

"Sales in 1955 reached an all-time high and shrimp is now the largest single fish product in dollar volume of sales."

Frozen shrimp for the first time took a lead over fresh shrimp in consumer sales. The frozen product sales rose 21 percent last year. Frozen shrimp now accounts for 54 percent of the total shrimp volume.

Shrimp consumption in 1955 was 356.1 million pounds (heads on) as compared to 325.1 million pounds in 1954. Frozen shrimp consumption in 1955 was 191 million pounds (heads on) as compared to 157.6 million pounds in 1954. Domestic production accounted for approximately three-fourths of the total; imports for about one-fourth.

--Excerpt from address at National Fisheries Institute Eleventh Annual Convention, April 18, 1956.

FISH-QUALITY DETERIORATION STUDY

As part of a large-scale study on objective tests for quality of fish, work at the Seattle Technological Laboratory of the U. S. Fish and Wildlife Service has been concentrated on compounds formed in the meat of fish while deterioration in quality is occurring. Fish of varying degrees of freshness are being analyzed to learn what these compounds are, and how they may be evaluated in terms of the level of quality of the fish. The first group of compounds being studied are the free amino acids, liberated from the protein of the meat by enzymatic action. Results to date indicate that certain reactive compounds are freed only after definite spoilage has occurred. Changes in fish muscle constituents during earlier stages of spoilage are now being studied.

STUDY OF DRIP IN FROZEN FISH

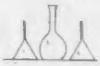
The loss of tissue fluid from fish frozen, then thawed, has for years been a vexing problem of fish processors and users. For example, the homemaker may think she is being sold water at the price of fish when the exuded fluid appears around the thawed portion. Studies now under way at the Ketchikan laboratory are aimed at a better understanding of the chemistry involved when the meat of fish loses these fluids.

In preliminary studies designed to characterize the proteins occurring in drip, frozen fish were thawed, minced and subjected to centrifugation. The fluid separated from the meat by this process was again centrifuged, this time at very high speeds. No solid particles were precipitated from the fluid during the centrifugation. No structural (fibrous) proteins from the musculature of the fish were observed to be precipitated following a ten-fold dilution of the drip with distilled water. Continued dilution caused the precipitation of a protein fraction, and subsequently, treatment of the remaining liquid with trichloroacetic acid precipitated a second fraction.

Protein characterization studies on the drip were also made using electrophoresis, the technique whereby protein fractions are separated by their different rates of movement under electrical impulse along a strip of porous paper. Three major fractions were observed which were soluble in dilute salt solutions.

Work to date indicates: (1) no solid proteinaceous particles or fibrous proteins can be found in the drip fluid from the meat of fish; (2) two major fractions of proteins, soluble in very dilute salt solutions, but differing in their solubilities in distilled water, were found to be present in the drip; (3) separation of the protein components of drip into three major groups was accomplished by taking advantage of the relative mobilities of the fractions during electrically-assisted diffusion along a strip of porous paper.

The apparent significance of the studies lies in the fact that the only protein components of drip found thus far are all soluble in dilute saline solutions corresponding to the salinity levels of the meat of the fish. As a preliminary hypothesis, it may be stated that drip from frozen and thawed fish meat contains only those proteins normally found in suspended form in the meat.



ANTIOXIDANT MIXTURES FOR PRESERVING FISHERY PRODUCTS

The possibility of increased preservation of fatty fish by the use of antioxidants is a matter of great importance to the fishing industry. Research contracted by the U. S. Fish and Wildlife Service to the University of California at Davis, Calif., has shown that mixtures of antioxidants are much more effective in preventing oxidative deterioration of food products than are any of the compounds alone. This synergistic action of antioxidant mixtures is now being tested under commercial conditions at the Fish and Wildlife Service's Seattle laboratory. Further information will be available when the tests are completed. The research is being financed with funds provided by the Saltonstall-Kennedy Act of 1954.

TUNA IDEAL FOR SUMMER PICNICS

If your family responds to your dinner call with mild enthusiasm, it is time for a change. Summertime is tuna time and also picnic time. So, why not change the family eating routine and treat them to a picnic supper either in your backyard or a nearby park? Picnics are the occasions when you can don sports clothes and serve simple but tasty food in a relaxed and enjoyable fashion.

Of course, it's the food that makes a picnic enjoyable and the enterprising planner will give the main course extra-special attention. Canned tuna packed with energy-giving protein is a flavorful basis for main-course salads or sandwiches. It is a natural ingredient, too, as there is little or no preparation. Just open a can and it is ready to use. And, it is economical, too, as there is no waste.

The home economists of the U. S. Fish and Wildlife Service suggest that you join the summertime outdoor parade and serve "Tuna Salad" at your next picnic supper.

TUNA SALAD

2 CANS (6½ OR 7 OUNCES EACH) TUNA
½ CUP MAYONNAISE OR SALAD DRESSING
1 CUP DICED CELERY
2 TABLESPOONS CHOPPED SWEET PICKLE
2 TABLESPOONS CHOPPED ONION
2 HARD-COOKED EGGS, DICED
DASH PEPPER
LETTUCE
TOMATO WEDGES

Drain tuna and flake. Combine next six ingredients. Serve on lettuce and garnish with tomato wedges. Serves six.

TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

MAY 1956: A total of 53 vessels of 5 net tons and over were issued first documents as fishing craft during May 1956--eleven more than in May 1955, according to the U. S. Bureau of Customs. The Alaska and South Atlantic areas led with 10 each, followed by the Gulf and Pacific areas with 9 each.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, May 1956 with Comparisons

Section	May		Jan.-May		Total
	1956	1955	1956	1955	1955
	(Number)				
New England	2	-	8	7	18
Middle Atlantic	5	3	13	8	13
Chesapeake	8	4	29	15	54
South Atlantic	10	13	24	28	65
Gulf	9	6	38	35	103
Pacific	9	13	23	39	117
Great Lakes	-	-	2	2	9
Alaska	10	3	22	15	35
Hawaii	-	-	1	2	3
Virgin Islands	-	-	-	-	1
Total	53	42	160	151	418

Note: Vessels have been assigned to the various sections on the basis of registered home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, May 1956

Net Tons	Number
5 to 9	18
10 to 19	18
20 to 29	7
30 to 39	6
40 to 49	1
130 to 139	1
170 to 179	1
180 to 189	1
Total	53

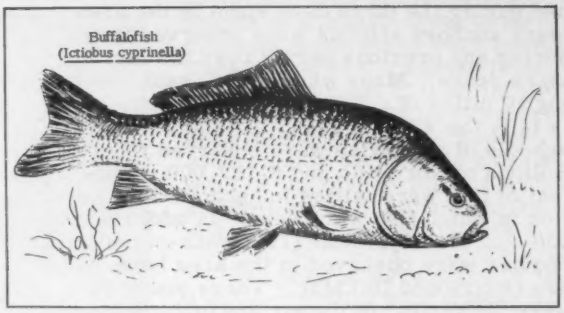
Arkansas

FISH AND RICE CROPS: More and more acres in Arkansas are being used to produce alternating crops of rice and fish. It has been estimated that 50,000 of approximately 1,000,000 acres of the State's rice lands are now being used for commercial fish production.

Reservoirs are an important tool in the production of each of these crops. In the rice-growing areas, the soil structure is such that little or none of the surface water will percolate to the substrata. Thus, to save this valuable water, dirt levees are thrown up to form reservoirs. These are used to flood the fields and to hold fish.

The cycle of rice and fish production is begun with the planting of rice. Water is pumped over the fields of growing rice and then is drawn off just before harvest time. After the rice harvest, the fields are flooded again and this time are planted with the desired fish species, such as carp, buffalofish, and channel catfish. At the end of two years, the fields are drained again and the fish crop is harvested. The marketable fish are sold, brood stock and surplus fish are returned to the reservoirs, and any undesirable species are destroyed.

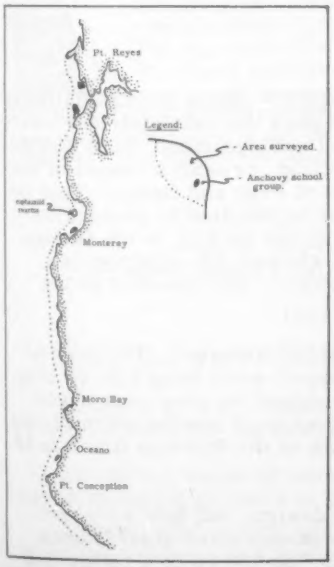
Though buffalofish and channel catfish are considered difficult to propagate in controlled waters, the job is being done on a hit-or-miss basis. The farmers who have been successful in producing fingerlings of these two species have a most profitable enterprise. It is reported that buffalofish fingerlings, 3 to 6 inches in length, are being sold for $50 to $75 a thousand. A rice grower who produced 700 pounds of buffalofish an acre over a two-year period recently sold his marketable fish and a considerable quantity of brood stock for only slightly less than he had received for his previous rice crop. To the price received for the fish could be added, of course, the value of stored water plus fertilizer (fertilizer the water is believed to return to the soil at the rate of approximately $20 an acre a year).



Game species produced by the rice growers are kept for sport fishing. An increasing number of reservoirs are being leased to sportfishing groups or opened to the public on a pay-to-fish basis, reports The Progressive Fish-Culturist (July 1956), a U. S. Fish and Wildlife Service publication.

California

PERIODIC FLIGHTS CONTINUED TO STUDY PELAGIC FISH DISTRIBUTION (Airplane Spotting Flight 56-4): The fourth of a series of periodic flights designed to study pelagic fish distribution, abundance, and behavior in 1956 was completed by the California Department of Fish and Game (Cessna "170" 1359D during May 7-11, 1956. The inshore area from Pt. Reyes to San Diego was surveyed.



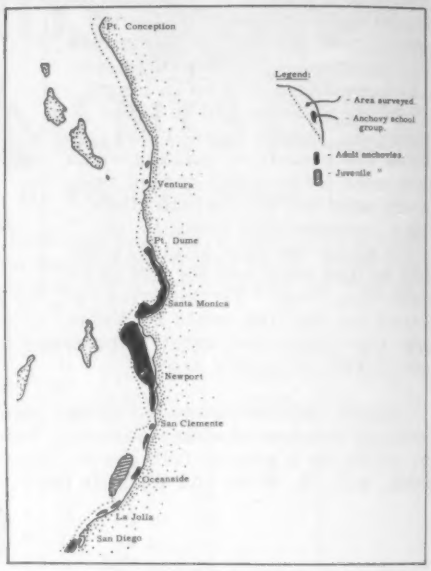
Airplane Spotting Flight 56-4 (May 7 and 8, 1956.

Despite the occurrence of rain showers on May 8 and 9, an excellent coverage of the coast was made. Visibility was good and exceptionally calm weather prevailed over the entire coast.

Plankton concentrations changed considerably since the April 2-6 flight. The large areas of rich "brown" water were replaced with clearer "green" water and visibility into the water was very good. Brown water was found only in small areas in Monterey and Drakes Bays. Euphausiid swarms were present in Monterey Bay again as in April and the salmon boats, both commercial and sport, were concentrated in the area where the euphausiids were concentrated. On May 7, 59 boats, and on May 8, 135 boats were observed in the area of euphausiid swarming which extended about two miles in diameter.

Most of the fish schools observed during this flight were very close to the surface, thus permitting good identification from the air. A check with the commercial and sport boats revealed a comparable fish distribution and identification as was made from the air.

Anchovy: Anchovy schools dominated the inshore area over the entire extent of the coast covered. Adult anchovy schools were very numerous south of Pt. Dume and during the three days spent in the area more anchovy schools were observed than during any previous period over the last three years. Maps were made, each covering 10 miles of coast line, to more efficiently tally the schools seen. A total of 3,039 schools of anchovies were observed from Bolinas to Coronado and 8,132,000 square feet of fish were tallied in each 10-mile section in which fish were seen. In addition, 550 schools of juvenile (1956 year-class) anchovies were observed in the area between San Onofre and Del Mar. These young fish were "breezing" on the surface in thin schools averaging about 3,000 sq. ft. per school. No adult fish of any species was observed near these young fish and no sea lions or birds were observed in the area feeding on the fish.



Airplane Spotting Flight 56-4 (May 8, 10, and 11, 1956.

Sardine and Mackerel: No schools of sardine and mackerel were observed in the inshore area covered. Routine sampling of the commercial and bait anchovy catch revealed the presence of a trace of "eight-inch" sardines mixed in with most schools of anchovies taken. Commercial fishermen reported catches of jack mackerel at San Clemente and Santa Catalina Islands and also reported some schools of adult sardines in these areas. A sample of adult sardines taken at Santa Catalina Island revealed that the fish were in near spawning condition. In comparison with last year, the adult sardines are remaining closer to the shore during the 1956 spawning period. It was not until the first week of June that adult sardines were seen along the coast in the spring of 1955.

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CATCH OF SHRIMP BEAM TRAWL NETS OF VARIOUS MESH SIZES STUDIED BY M/V "N. B. SCOFIELD" (Cruise 56-B-1): To compare the catch (size of individuals and total quantity) of shrimp beam trawl nets of various mesh sizes was the principal purpose of this cruise by the M/V N. B. Scofield, research vessel of the Marine Fisheries Branch of the California Department of Fish and Game. This information is to be used in making recommendations for legislation to protect the necessary numbers of spawners. Fishing was for Pandalus jordani in the Bodega Bay area. In addition, the vessel attempted to collect shrimp, (P. platyceros), with two types of experimental traps just south of Monterey, and checked on the abundance of abalones on the Farallone Islands.

A beam trawl frame 20' across with a single cross bar was used. For most net comparisons two trawl nets, each 10 feet across the mouth were hung side by side. This method cancels out the tendency of the shrimp to school by size even within the same bed. Scouting was begun off Pt. Reyes and continued northward until commercial-size catches were made just south of the mouth of the Russian River in 40 fathoms.

The experimental shrimp traps were of one basic design, but half were constructed of heavy "hardware cloth" steel mesh and the others were steel frames covered with cotton net webbing; the only bait used was fish livers in a rather bad state of decomposition.

A total of 100 drags were made with the beam trawl. Of this number 65 had enough shrimp in each net to constitute adequate samples for comparison. One 25-minute drag produced 1,200 pounds of shrimp. Nets of six different mesh sizes were used. These covered the spread from a mesh minimum of 0.69 inch to a maximum of 1.84 inches measured inside the knots. Exact evaluation of the results will depend on the measuring of the individual shrimp in the samples and organization of this data.

N. B. Scofield.

No prawns were taken in the 4 days of fishing with traps. The probable cause was improper bait. Lampreys were taken at an average of about nine per trap per setting.

The abalone exploration at the Farallone Islands was limited to one morning. Abalone are normally found in quantity only on the rougher shores, i.e. they would be expected only on the windward side of the islands. The swell was heavy enough to make it impossible to get in close enough to dive, let alone to do any actual diving. Instead dives were made in three places in the lea of the islands. Abalone were quite scarce, as was expected.

Cans--Shipments for Fishery Products, January-April 1956

Total shipments of metal cans during January-April amounted to 39,330 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 23,881 tons in January-April 1955. The increase in January-April 1956 probably reflects the heavier pack of canned tuna as compared with the January-April 1955 period. Packs of other fishery products are usually light during this period of the year.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Electronic Devices Utilized in Fishery Research and Management

Unwittingly and involuntarily the fish has "gone electric."

An electric fence has been used successfully by the U. S. Fish and Wildlife Service to keep the big Kodiak bear away from critical sections of salmon streams.

Electrical weirs protect fish by jolting the life out of sea lampreys on their way to spawning grounds to bring forth more lampreys to prey on more fish.

A "tattletale" electronic device, called a sonic tracker, is being attached to the back of salmon and for as much as 100 hours every twist and turn of the fish is flashed to a recording instrument on land or in a boat.

Fish count themselves when passing through another device created by the Fish and Wildlife Service and at times the fish take their own pictures.

Fish protection at powerplant intakes by use of electrical fish screens is being studied by the Fish and Wildlife Service, while in other places fish are being spotted for harvesting by any one of several fish finders which have been developed by electronic specialists.

An underwater telemeter which indicates the depth of nets has solved one of the problems of midwater trawling. Underwater television is telling the Fish and Wildlife Service more about fish in their regular habitat and more about what could be done to make fishing gear more efficient and effective.

Fish "shockers" are used to temporarily "knock out" fish in a stream to permit stream population counts.

Besides these, there are the fathometers used to measure ocean depths, radar and electrical beams and direction finders to guide ships and planes, and radio for communications.

All of these devices the Fish and Wildlife Service uses--some, like the fish counter, the Fish and Wildlife Service created; some, like the sonic tracker and underwater telemeter, electronic specialists created at the behest of the Fish and Wildlife Service; others, such as the fish finders and the underwater television, other sources created and developed and the Fish and Wildlife Service adapted for it use.

Three of these devices--the electric fish counter, the sonic tracker, and the fish-guiding apparatus--apply particularly to salmon studies but can be used on other species of fish as well. In fact, considerable interest has been shown in the fish counter and in the guiding device by many state fish and game departments. The sonic tracker is too new to elicit widespread comment yet.

The sonic tracker is to be used to study the passage of fish through fishways. The initial studies will be made at Bonneville Dam on the Columbia River where the Service has the facilities to observe fish behavior in several types of fishways. By being able to chart the reactions of salmon to various types of fishways, Service technicians hope to be able to determine the most effective fish-ladder design.

The sonic tracker is a capsule about 2.5 inches long and less than an inch in diameter which is fastened to the back of a salmon just to the rear of the dorsal fin. Studies show that the fish's reactions are normal about five seconds after the tracker is attached. It contains a 15-volt battery and other transmitting apparatus capable of sending signals for a period of time varying from 10 hours to 100 hours. The signals can be detected as far as 2,000 feet under ideal conditions. A fish carrying the capsule can be tracked and its position pinpointed for about 800 feet in clear still water and for about 100 feet in rough, turbulent streams. The receiver which automatically registers the movements can be placed on shore or installed in a boat. Sound waves may be varied so that movements of as many as ten fish can be traced at the same time.

The chief value of the electric fish counter at present is to test the effectiveness of the fishways as well as to register the number of salmon heading for the spawning grounds. The continuance of a salmon fishery depends to a great extent upon a sufficient number of adult fish reaching the spawning area. The practice of making visual counts at fish ladders and in streams has not been entirely satisfactory.

The counting device is fully automatic, not only counting the fish and indicating the size and direction of travel, but, through the medium of an underwater camera, it can identify the species of fish. The counter can also be adjusted merely to sound a signal when a fish goes past, thus alerting a watcher to his task. It is also possible to have the dial, which registers the fish, installed in an office or at some other point some distance from the stream. Indications are that this instrument, when fully developed, will be used in many parts of the Nation where fish runs are important and in many places where fish counts are needed.

Numerous techniques in screening young fish from water diversions have been tried with varying degrees of success. Since the power turbine and some of the big irrigation diversions offer a major threat to young fish, especially salmon on their way back to the sea, the Fish and Wildlife Service has done considerable research on mechanical and electrical methods of meeting the problem. Considerably more research is necessary along this line.

In small experimental streams these devices have been about 95 percent successful in guiding the fish into the desired places. Testing is now being done on large streams. Two methods have been used, one based on the fact that fish are attracted to the positive pole. The other is based upon the principal of repulsion of fish by an electrical field.

The sea lamprey weir is an electrical barrier placed across a stream used by the lamprey for spawning. The weir is an apparatus of charged electrodes which sets up an electrical field which kills any sea lamprey attempting to pass through it. The weirs are installed in streams tributary to the Great Lakes in cooperation with the respective state fish and game departments. The sea lamprey which entered the upper Great Lakes about 20 years ago has destroyed the lake trout fishery of Lake Michigan and Lake Huron and has now appeared in Lake Superior. Its control is a major objective of the Service and allied agencies.

The underwater telemeter is a device which indicates the exact distance of the trawl or net below the surface of the water. Its use will aid considerably in increasing the efficiency of midwater ocean commercial fishing, especially the exploratory work which will be necessary to determine the fishery values of the midwater area. Comparatively little midwater fishing has been done by United States fishermen, who have concentrated on surface and bottom fishing.

The Fish and Wildlife Service has two underwater television units. One of these is at the Gear Research Laboratory at Coral Gables, Fla., and the other is at the Fishery Laboratory at Woods Hole, Mass. At Coral Gables, the television has permitted close scrutiny of fishing gear in actual operation under water. It is expected that this research will result in many improvements in the efficiency of commercial fishing gear. At Woods Hole, biologists are more concerned with the effect of fishing gear upon fish which are too small for market. The sizes of fish which will escape through the meshes of trawls will be studied, as well as the manner of escape and behavior within the net, so as to determine methods of saving small fish from destruction. Biologists will also make various studies of the ocean bottom and the small marine animals which inhabit the bottom and serve as fish food.

In order that underwater television might be better utilized, the researchers at Coral Gables have developed an electrically-controlled vehicle which permits the manipulation of the camera under water.

The use of the electric shocker in making fish population studies has been an accepted practice for years, but recent adaptations made by the State of New York under a Federal-aid project now makes the shocker effective in soft water, thereby extending its usefulness into many areas.

The electric fence protects the spawning salmon from the bears. Generally speaking Kodiak bears can go any place they desire to go but a few brushes with the fence had a very salutatory effect upon the big fellows. This experiment has been in operation for about three years.

Thus electricity and electronics play a major role in the life of fish, protecting them from harm until such time as they become useful to man, at which time it swings against the fish and over to man, as attested by such devices as fish finders and the electric range.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, MAY 1956: The Army Quartermaster Corps in May 1956 purchased 2,715 pounds (valued at $1,322,000) of fresh and frozen fishery products for the use of the U. S. Army, Navy, Marine Corps, and Air Force. This was 48 percent more in quantity and 58.9 percent more in value than purchases the previous month and 26.9 percent more in quantity and 43.4 percent more in value than purchases in May 1955.

Purchases of fresh and frozen fishery products during the first five months of 1956 totaled 9,494,000 pounds (valued at $4,855,000)--12.3 percent less in quantity but 4.6 percent more in value than purchases for the same period a year earlier. This indicates that this year the purchases consisted of higher-priced products.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (May and the First Five Months of 1956 with Comparisons)

QUANTITY				VALUE			
May		Jan.-May		May		Jan.-May	
1956	1955	1956	1955	1956	1955	1956	1955
. . . (1,000 Pounds) . . .				. . . . ($1,000)			
2,715	2,139	9,494	10,825	1,322	921	4,855	4,639

Prices paid for these fishery products by the Department of Defense in May averaged 48.7 cents a pound as compared with 45.3 cents a pound the previous month and 43.1 cents a pound in May 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces generally make some local purchases which are not included in the data given above. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.

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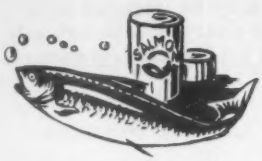
QUARTERMASTER CANNED SALMON REQUIREMENTS FROM 1956 PACK: Tentative requirements for a group of canned food items from the 1956 pack to meet the needs of the Armed Forces were announced June 28 by the Department of Defense. Included in the requirements are 5,201,000 pounds of coho or medium red



salmon packed in No. 1 tall cans. These estimated requirements are subject to modification and are listed to aid industry in planning 1956 production. Procurement will be effected by the various Market Center offices of the Army Quartermaster Market Center System, with headquarters at 226 West Jackson Blvd., Chicago 9, Ill.

Films

FISHERY FILMS SELECTED FOR INTERNATIONAL FILM FESTIVAL: Four new documentary motion pictures produced by Interior Department agencies in cooperation with private industry are among the eight United States Government films selected for showing at the 1956 Film Festival in Edinburgh, Scotland, in August and September, Secretary of the Interior Fred A. Seaton announced June 29. The film festival is part of the International Festival of Music and Drama in which about 25 nations participate annually.

Two of the chosen entries were produced under the supervision of the Fish and Wildlife Service, and two under the Bureau of Mines. This is the second time this honor has been won by the Fish and Wildlife Service.

Maine lobsterman. A scene in the film Outboard Fisherman U.S.A.

Boats, blue water, and seafood fit for a king but within reach of all are featured in the Fish and Wildlife Service pictures. The films, all in 16mm. color and sound, and the names of the private industry sponsors are:

Outboard Fisherman U.S.A., financed by the Outboard, Marine and Manufacturing Company of Milwaukee, Wis., makers of outboard motors. It shows how the rugged, small, independent commercial fisherman, using outboard motors, contributes to the national economy. Scenes from 10 areas in the United States and Alaska show the catching of 10 different species of fish and shellfish using various colorful fishing techniques.

Shrimp Tips from New Orleans, financed by The Peelers Company of that cosmopolitan city, manufacturers of shrimp processing equipment. The film reflects, in its unusual style of cooking, music, and architecture, the people from many countries who settled there. Six shrimp recipes are cooked and served in typical New Orleans atmosphere showing the influence of various countries upon New Orleans culture.

The other two Interior Department films selected are The Petrified River--The Story of Uranium and Arizona and its Natural Resources.

A scene in the film Shrimp Tips from New Orleans.

These films may be secured on a loan basis without charge, although only one, Arizona and its Natural Resources, is available at the present time. The other three will probably be ready for distribution before September.

Each year the United States sends Government and non-Government films to the Edinburgh Festival. The American Government films are selected by the Interdepartmental Committee on Visual and Auditory Materials for Distribution Abroad. This committee, in turn, works through subgroups, one of which is the Subcommittee on Motion Pictures.

The Committee is now considering the selection of exhibits to the International Exhibition of Cinematographic Art which will be held in Venice, Italy, after the Edinburgh Festival.

Fish and Wildlife Motif on United States Postage Stamps

The second (pronghorn antelope) of the three stamps being issued to emphasize the importance of Wildlife Conservation in America was released at Gunnison, Colo., on June 22, 1956, the Post Office Department announced on April 23. This special 3-cent stamp was first placed on sale on the occasion of the annual convention of the Colorado Division of the Izaak Walton League. The first (wild turkey) stamp in this series was issued at Fond du Lac, Wis., on May 5, 1956.

The design of this stamp portrays a buck and two does of the pronghorn antelope species in their natural habitat.

The pronghorn antelope, which is the subject of this issue, is an outstanding example of the conservation work being carried on by the Federal and State Governments. Antelopes have been protected, studied, and transplanted under scientific guidance so that their numbers have increased from a low of 17,000 to herds large enough to allow hunting in five Western States.

The stamp is 0.84 by 1.44 inches in dimension, arranged horizontally with a single outline frame, printed by the rotary process, electric-eye perforated, and issued in sheets of 50.

Note: Also see Commercial Fisheries Review, April 1956, p. 13.

Fish and Wildlife Service

NEW RESEARCH LABORATORY TO STUDY PROBLEMS OF GULF FISHERIES: Problems related to finding, catching, and processing Gulf of Mexico fish and shellfish will be tackled at the new U. S. Fish and Wildlife Service fishery laboratory to be constructed this year at Pascagoula, Miss., Secretary of the Interior Fred A. Seaton announced July 18.

Contract for the construction of the new laboratory and auxiliary buildings has been awarded to the Oden Construction Company of Hattiesburg, Miss., for $165,000. Engineers of the Service's Regional Office in Atlanta, Ga., will exercise general supervision of construction. In addition to the fisheries research building, there will be a net facility and a smaller structure to be used for fishing gear fabrication.

Research on methods and techniques for providing the highest quality pack of shrimp, oysters, tuna, and other south Atlantic and Gulf seafoods will be one of the main tasks of the new laboratory. Heretofore technological work for the Gulf and south Atlantic areas was handled through the Service's laboratory at College Park, Md.

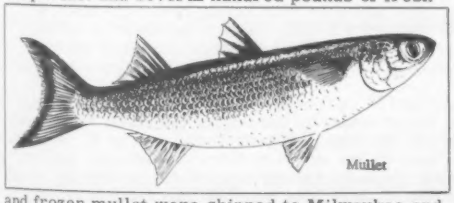
The new installation will provide facilities for the exploratory fishing and gear development program now being conducted in the Gulf area. The Service's exploratory fishing vessel Oregon, which operates in the Gulf of Mexico, is based at Pascagoula in connection with this program.

Office space also will be furnished in the new laboratory for local personnel engaged in statistical work and the educational and market development programs.

Florida

FISHERIES RESEARCH, JANUARY-MARCH 1956: The following are some excerpts from the Quarterly Report on Fisheries Research, March 1956, of The Marine Laboratory of the University of Miami.

Mullet Marketing Study: As part of the program to expand demand for mullet, an experimental smokehouse was built. Inquiries were made on the possibility of creating a market for mullet in Milwaukee for smoking. Locally-smoked mullet were taken to Milwaukee to demonstrate the quality of the product and several hundred pounds of fresh


Mullet

and frozen mullet were shipped to Milwaukee and smoked there by a large commercial smoker. The smoked mullet were introduced through the regular channels of distribution. Use of mullet for this purpose will depend on solving problems of price and low yield after cleaning.

Questionnaires were mailed to several hundred institutions in the southeastern United States to determine their buying habits. An analysis of their answers will be presented to dealers so they can better cultivate this market for Florida seafoods and increase demand for their products.

Shrimp Technology: BLACK SPOT: (1) Further experiments were carried out to determine the degree of thiamine destruction and amount of residual SO_2 in shrimp treated with sodium bisulphite at levels which offer adequate protection against black spot. Two series of tests consisting of a total of 36 analyses showed no significant differences in the amount of thiamine between the bisulphite-treated and control shrimp samples. The SO_2 residual was from 22 to 65 times lower than in dried fruit of well known brands. A high degree of thiamine destruction and high amounts of residual SO_2 were the major objections to the use of bisulphite in shrimp that were anticipated from the U. S. Food and Drug Administration. Now that these potential objections have been removed, the way is paved for an application for the necessary approval from the Food and Drug Administration for the use of bisulphite in shrimp. The necessary brief has been prepared.

(2) Frozen shrimp obtained from a wholesale source were thawed and then stored in flake ice containing 0.1 percent sodium bisulphite. This

preliminary experiment indicated that the rate of black spot formation can be reduced using the bisulphite flake ice. Further experiments are to be carried out.

(3) Field trials were conducted with butylated hydroxy toluene antioxidant ice in Tampa. Fifty tons of this ice were prepared. Due to an unforseen delay in the departure of the fishing vessel, the ice had to be stored for about one week at 10° F. As a result, it was supercooled upon loading aboard the vessel. The greatly reduced chilling and bathing effect due to the lower melting rate of the ice caused a high amount of black spot and spoilage. It is planned to repeat the test.

ANTIBIOTIC ICES: The degree of uniformity in which aureomycin is distributed in the ice was studied. Twenty-eight analyses were run on aureomycin ices in which seven different combinations of carrying agents were used. Carrageen was superior to high viscosity carboxymethylcellulose and to methylcellulose. The main objection to the use of the carrageen (SeaKem 9) carrier is that it contains calcium ions which catalyze the black spot reactions.

SPOILAGE DETERMINATION TESTS: Chromatographic analyses of the animo acids in shrimp were started. The object of this study is to determine whether and what type of relationship exists between the degree of spoilage of shrimp and the quality and quantity of certain amino acids present. It is hoped to use such a relationship as an indicator of recipient spoilage in shrimp.

SMALL SHRIMP STUDIES: It has been stated that "size of mesh does not control to any marked degree the size of shrimp caught." This is not true, as experimentation in North Carolina and now by ourselves has shown.

Tortugas experiments: objectives: (1) to get data on seasonal changes in average size of shrimp on the fishing grounds; (2) to get data on area differences in average size of shrimp on the fishing grounds; (3) to find average size of shrimp retained and escaping through cod ends of various mesh sizes; (4) to standardize mesh-measuring techniques and determine shrinkage characteristics of cod ends; (5) to relate length data to commercial "count" (weight) categories.

Procedures: boat: Manboy out of Key West, 110' single-screw; 170 hp. engine. Cruises 8.5 knots, fishes 3 knots (9' x 3'4" boards).

Objective is not to see how many shrimp can be caught, but only to see what sizes are caught. Also, to compare what goes through the cod end meshes with what is retained in the cod end.

Fishing is done on two successive nights during the first two weeks of each month. Three hauls are made each night of two hours duration, covering about 6½ nautical miles each. The first three hauls are made due west from a point about 4 miles north and 8½ miles west of the Wreck Buoy. The second three hauls are made to the east, parallel to the first series, starting at the easterly end of the area trawled the first night and 4 miles south of it. The area includes a depth range of from 13 fathoms to 17 fathoms.

The net is a 100' Florida flat trawl. The cover is untarred cotton of 1" stretched mesh when new and dry (less due to shrinkage). It is attached about 12 meshes below the beginning of the cod end. It trails about 4-5 feet past the end of the cod end.

The net is fished exactly as a commercial net would be. When the net comes aboard the cover net is opened and its catch is put aside. Then the cod end is opened. Estimates are made (1) of the weight of the total (shrimp and trash); (2) of the trash; (3) shrimp; (4) finfish, shell and sponge. Note is made of the proportion of shrimp still alive in the cover bag.

A known proportion of the total catch is then separated. The shrimp are separated from the trash, headed, and the heads preserved for measurement. The rest of the catch is headed and sold.

At the conclusion of each haul, surface and bottom salinities and surface and bottom temperatures are recorded. Certain weather data are recorded.

The shrimp are measured by taking the length of the cephalothorax (head) between the notch in the eye socket and the far end of cephalothorax. These were converted to count sizes by actual observations.

Meshes were measured on the nets used. Considerable shrinkage occurs after soaking, reducing the average mesh size 10-20 percent.

Three cod ends with mesh sizes of 1¾", 2", and 2½", but otherwise identical to gear used commercially, were used. The 2½" is not in commercial use.

The different size meshes caught different sizes of shrimp. The data obtained shows the percentages of various sizes of shrimp caught by the 3 mesh sizes, comparing 70 count and smaller shrimp, 31-60 count, and 30 count and larger shrimp. They show that 43 percent of the shrimp caught in the 1¾" mesh net were smaller shrimp (less than 70 count), 48 percent were medium size (31-60 count), and 9 percent were large shrimp (over 30 count). In the 2" net, 38 percent were small, 54 percent medium and 8 percent large; in the 2½" net, 16 percent were small, 75 percent medium and 10 percent large. Thus the small-meshed net was catching more smaller shrimp than the other two.

The 1¾" net catches practically all the shrimp on the grounds; 98 percent of the small shrimp and all the medium and large shrimp. The 2" net catches less of the small shrimp--91 percent, but nearly all the medium and large shrimp. The 2½" mesh caught slightly less than half (49 percent) of the small shrimp, 77 percent of the medium, and nearly all of the large shrimp.

Hence the ability of nets of different sizes to catch shrimp of different sizes is unquestionable.

Great Lakes

ELECTRICAL WEIRS TO CONTROL SEA LAMPREYS MUST REMAIN IN OPERATION EIGHT YEARS: The Great Lakes sea-lamprey control program discovered recently that electrical weirs now in operation on major streams must remain in operation at least 7 to 8 years and possibly longer to be effective.

Sea lampreys stay in the Great Lakes as fish-killing adults at least one year, then migrate up inland streams and lay their eggs in gravel beds. The eggs hatch soon after and the young spend their larval stage in mudbanks.

Formerly, it was thought this larval stage lasted four years before the young moved downstream for their rampaging period of Great Lakes fish destruction.

But continuing research by the U. S. Fish and Wildlife Service and the Michigan Conservation Department's institute for fisheries research first showed this larval stage to be not 4 years, but 5 years, then at least 6, now "at least 7 to 8 years and possibly longer."

In short, it means that electrical weirs now in some streams must be in operation at least this length of time to halt all possible spawning lampreys and put an effective check on the predator.

Such complete control through use of weirs, fisheries workers admit, may be very difficult, even impossible.

The information places new emphasis on the only other presently-known method of control--use of chemicals to kill larvae lying in upstream mudbanks.

Electrical control device of the 2-line suspension type. This device was installed by the Fish and Wildlife Service on the Ocqueoc River, a tributary to Lake Huron. Traps for fishes and sea lampreys are located on either bank of the stream.

Two chemicals are known to kill the young larvae without damage to fish life. These chemicals recently were discovered at the Fish and Wildlife Service research station near Rogers City, but both presently are unavailable in commercial quantities and production would be costly, a Michigan Department of Conservation news bulletin points out.

Great Lakes Fishery Investigations

FISHERY STUDY OF SAGINAW BAY INITIATED BY M/V "CISCO" (Cruise 1): This cruise (June 3-11) of the Cisco initiates an intensive hydrographic and fishery study of Saginaw Bay that will be continued until late November 1956. Primary objectives of the study are to determine the composition and condition of fish stocks in the Bay and to establish the physical, chemical, and biological factors that may influence or regulate these populations.

One hydrographic transect was made between Harbor Beach and East Tawas extending "dog-leg" fashion out into Lake Huron. A second transect was made from

East Tawas to Bay City. Complete hydrographic data (plankton, light penetration, Nansen-bottle cast, and vertical temperatures) were obtained at three points on the first transect and at two locations on the second. A thermal profile of each transect was obtained from bathythermograph casts made at 5-mile intervals, and from a continuous record of surface temperature. Drift bottles were released at regular intervals along each transect to explore water movements in and near the Bay. These transects will be run and similar data collected during each cruise this year. Detailed descriptions of the operations will not be made in subsequent cruise reports.

The vertical distribution of fish in deeper water at the northeast end of Saginaw Bay (off East Tawas) was explored by fishing gill nets set obliquely from the surface to the bottom. The catch in nets set in 13 fathoms indicated a fair concentration of large bloaters (Leucichthys hoyi) near the bottom, and a scattering of yellow perch (Perca flavescens) and smelt (Osmerus mordax) at midlevels. The catch was extremely light at 26 fathoms. Only one lake herring (Leucichthys artedi), two bloaters, and two smelt were taken. Nets will be fished at these locations throughout this summer and fall to learn if this may be the area occupied by the walleye (Stizostedion v. vitreum), lake herring, and smelt during the period when they "disappear" from the fishery in Saginaw Bay.

The temperature of Lake Huron was low with a minimum recorded surface temperature of 4.3° C. (37.7° F.). Thermal stratification in the open lake was slight to absent. In Saginaw Bay stratification was more pronounced but the epilimnion extended to the bottom except in the deepest basins. Surface water temperatures in the Bay were high, with the highest temperature (24° C., 75.2° F.) recorded in the shallow southwest end.

A cooperative study with the Michigan Institute for Fisheries Research was begun on June 7. Two Service vessels, the Cisco and the Musky, and a Michigan patrol boat made two transects each across different sections of Saginaw Bay, taking a total of 51 bottom samples, releasing 350 drift bottles, and taking many water samples, plankton samples, and surface and subsurface water temperature readings. Several bottom cores were also obtained. The transects were spaced so that a reasonably accurate picture of Saginaw Bay bottom fauna, bottom types, water chemistry, and temperatures and currents could be obtained. Similar transects will be run again in midsummer and in the fall. It is hoped that the data might reveal some reasons for the striking changes in fish composition which have taken place in Saginaw Bay in recent years.

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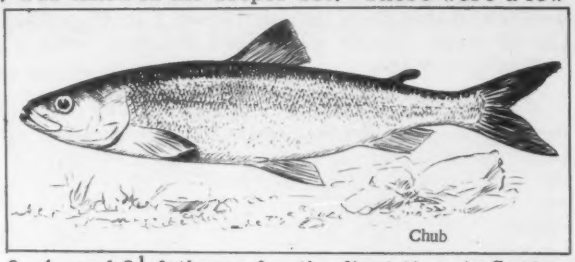
CHUB POPULATIONS IN LAKE HURON STUDIED BY M/V "CISCO" (Cruise 2): In order to determine the composition and condition of the chub populations, the Service research vessel Cisco extended this cruise (June 19-July 2, 1956) from Saginaw Bay into Lake Huron. Commercial exploitation of the chubs in Lake Huron has been resumed during the past two years. This fishery has become increasingly important with the decrease in size and quality of chubs from Lake Michigan.

Nylon gill nets ($2\frac{1}{4}$-, $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, and 4-inch mesh) were set on the bottom in 25 fathoms off Harbor Beach and in 50 fathoms in midlake between Harbor Beach and Goderich to sample the chub population. The shallow set contained practically all bloaters (Leucichthys hoyi). The deeper nets made a good catch of large longjaws (L. alpenae) and also took several L. kiyi, L. zenithicus, and L. reighardi. The catch of L. reighardi was especially interesting since this species has not been recorded previously from Lake Huron. Preliminary comparisons indicate that these chubs are consistently larger than those taken in the same nets during Cisco operations in Lake Michigan.

Oblique gill-net sets in 13 and 26 fathoms off East Tawas were repeated during this cruise to establish the vertical distribution of fish at the lakeward end of Saginaw Bay. Only one fish (a bloater) was taken in the deeper set. There were a few bloaters scattered throughout the shallow set, except near the surface. A bull net (300' long, 120 meshes deep, $2\frac{1}{2}$-inch mesh) was set over a 13-fathom bottom with the float line 6 feet beneath the surface. This net took 11 alewives (Pomolobus pseudoharengus), 2 yellow perch (Perca flavescens), and 1 smelt (Osmerus mordax).


Chub

Trawling was attempted in 8, 6, 4, and $2\frac{1}{2}$ fathoms for the first time in Saginaw Bay, but much difficulty was encountered in locating good bottom for this work. The catches were entirely yellow perch and forage fish.

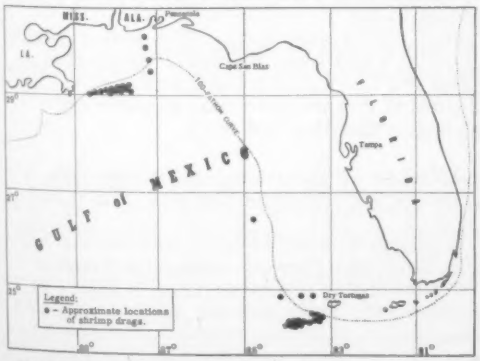
Hydrographic transects from Bay City to East Tawas, East Tawas to Harbor Beach, Harbor Beach to Goderich, East Tawas to Oak Point, and Hat Point were completed this cruise. Standard operations completed on transects were described in the report of cruise 1.

Surface water temperatures ranged from 7.0° C. (44.6° F.) to 23.1° C. (73.6° F.). The water is thermally stratified in all but the very shallowest areas of Saginaw Bay.

A night study on vertical migration of Mysis relicta, an important fish-food organism, was made in 25 fathoms off East Tawas. Some Mysis reached the surface about two hours after sunset, but many of them appeared to descend shortly thereafter, probably influenced by a bright moon.

Gulf Exploratory Fishery Program

DEEP-WATER RED SHRIMP COMMERCIAL POTENTIAL BEING EXPLORED M/V "OREGON" (Cruise 39): A total of seven days of round-the-clock fishing yielded a catch of approximately 2,700 pounds of red shrimp (heads off) that averaged 26-30 count, the Service's exploratory fishing vessel Oregon reported on its return to Pascagoula on June 26. The vessel returned from a two-week cruise to the southeastern and northeastern Gulf. The principal objectives of the trip were to obtain information on the commercial production potential of deep-water red shrimp (Hymenopenaeus robustus) in two areas of promise discovered during previous Oregon fishing, and to obtain iced and frozen samples of red shrimp for technological studies. The fishing on this trip was carried out with 80-foot balloon and 100-foot flat trawls. Individual drags were of 2- to 4-hour duration.



M/V Oregon Cruise 39 continued to explore deep-water red shrimp potential in the Gulf.

Highest catch rates were obtained west-southwest of Dry Tortugas in depths

of 210 to 220 fathoms. Catches ranged from 50 to 490 pounds and averaged 225 pounds of heads-on shrimp per drag. Three days of fishing between 83°06' W. and 83°35' W. caught a total of 3,145 pounds of heads-on red shrimp. In addition, catches in this area included from 1 to 45 pounds of an unidentified species of large (21-25 count, heads on) striped shrimp. Only one of the 15 drags resulted in serious gear damage.

Four days of fishing operations were conducted in depths of 200 to 250 fathoms between the Mississippi Delta and off Mobile. One day of test dragging was needed to locate optimum fishing depths (240-250 fathoms). The 14 successful drags made during the next three days caught from 61 to 224 pounds of heads-on red shrimp, and averaged 130 pounds per drag. A total of 2,055 pounds of heads-on shrimp were caught in this area. One trawl was damaged due to bogging.

Three drags were made southwest of Tampa in 210 to 215 fathoms. Six pounds of red shrimp were taken in one of the hauls. One of the trawls was lost.

Penaeopsis megalops (a smaller deep-water shrimp) were mixed in the red shrimp catches in all areas fished. The largest catch was made south of Mobile in 210 fathoms. The heads-on count of this species varied from 45 to over 60 a pound.

The Oregon was scheduled to depart Pascagoula on July 17 to carry out eight days of experimental tuna long-line fishing in the north-central Gulf area. The primary objectives of this cruise were to obtain additional information on the depth limits of yellowfin tuna stocks, and to obtain tuna samples for technological study.

Eight 50- to 100-basket sets were to be made, in each of which 10- to 20-basket units were to be set in 25- to 50-fathom depth intervals, from the surface to depths of 200 fathoms.

A series of different size groups of yellowfin tuna were to be subjected to a variety of handling methods (bleeding, chilling at various time intervals after landing, dry and brine freezing, etc.) and samples were to be frozen for laboratory studies on meat discoloration by the Service's Technological Section.

Food Irradiation Sterilization Pilot Plant

The three most suitable sites for a proposed multimillion-dollar Federal pilot plant for research and development of techniques for irradiation sterilization of foods will be selected by a committee of five civilian scientists. The Maine sardine industry's research director Dr. Berton S. Clark has been named to sit on this committee. Dr. Clark, on July 11, accepted the non-paying assignment at the request of the United States Quartermaster General and the National Academy of Sciences, reports a news release from the Maine Sardine Industry.

A government committee will suggest 10 sites as the result of preliminary screening and the civilian committee will review and evaluate the data and select the three best possibilities.

Dr. Clark, whose home is in Oak Park, Ill., is a former research director for the American Can Company and entered the employ of the sardine industry two years ago to head up a technological research and quality-control program. His headquarters are at the University of Maine.

Maine Sardines

CANNING COSTS INCREASE: Maine sardine canners, now working on the new season pack, have been told to expect greatly increased production costs over the 1955 season, a June 7 Maine Sardine Industry news release announces.

A raise in the minimum wage as set by Congress from 75 cents to $1.00 an hour plus boosts in oil, cans, cases, salt, and freight all adds up to a substantial figure. Volume as it affects general overhead of individual packers will have considerable bearing on the ultimate cost picture, but under any circumstances the increases will be the highest for any single year in the history of the industry.

Washing dressed herring in a Maine sardine cannery.

This disturbing situation was outlined for the packers June 7 by a Rochester, N.Y., auditing firm, which has been employed by the group to conduct an industrywide cost-accounting program for the past two years.

A schedule of the increases as they apply to the standard 100-can case of keyless and key-opening oil-type, which are the principal items packed, was supplied by the firm as follows: direct labor up 15 percent; indirect labor up 10 percent; oil up 21 percent; cans up 8.7 percent; cases up 5.5 percent; salt up 5 percent; and freight up 6 percent.

In releasing the report the industry's Executive Secretary stated that with the new round of increases it was now costing Maine canners about $2.00 a case more to pack keyless and $2.50 more to pack cans with keys than it did in 1950 and nearly triple the 1933 figure.

"Naturally every cost increase makes our position in the food business all the more competitive, but we are still able to offer sardines at a price to the consumer that makes them one of the best buys on the market," the Secretary added.

He said that although selling prices varied during the past year they did not always reflect a realistic cost figure and that on numerous occasions and for many reasons shipments were moved at a loss to the canners.

* * * * *

CANNED STOCKS, JUNE 1, 1956: Distributors' stocks of Maine sardines amounted to 160,000 actual cases as of June 1, 1956, a decrease of 108,000 cases

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, June 1, 1956, with Comparisons

Type	Unit	1955/56 Season				1954/55 Season				
		6/1/56	4/1/56	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54
Distributors' Stocks	1,000 actual cases	160	268	326	354	235	n.a.	331	n.a.	n.a.
Canners' Stocks	1,000 std. cases1/	64	152	475	625	723	575	715	1,239	1,410

1/ 100 3¼ oz. cans equal one standard case. n.a. - not available.

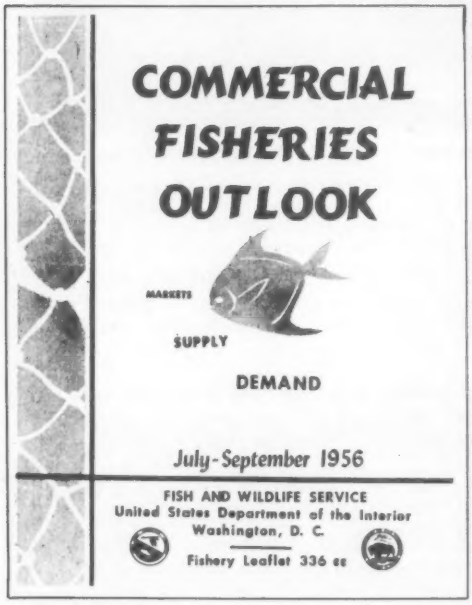
(40 percent) from April 1, 1956. Stocks on June 1, 1956, were 166,000 cases less than January 1, 1956, according to estimates based on the results of a series of measurements for the 1955/56 marketing season by the U. S. Bureau of Census.

Canners' stocks as reported by the Maine Sardine Industry totaled only 64,000 cases (100-3¼ oz. cans) on June 1, 1956. Canners' stocks for the same month in 1955 amounted to 575,000 cases and on January 1, 1956, totaled 475,000 cases.

Market Outlook for Fishery Products

JULY-SEPTEMBER 1956: The third quarter--peak production period for United States fisheries--will see a good catch of halibut, a good seasonal take of shrimp, opening of the oyster season, and the marketing of increasing supplies of canned tuna, Alaska salmon, and Maine sardines, according to the Commercial Fisheries Outlook, July-September 1956, issued July 17 by the U S. Fish and Wildlife Service.

Already the tuna catch is 50 percent above the midyear mark of 1955 and the tuna pack is up 44 percent. Halibut fishermen are making catches which should bring the halibut harvest this year somewhat above that of last year. While shrimp fishing has been at a seasonal low, it is now going into a period of peak production and unless adverse weather conditions hamper the fishermen the shrimp catch this year should be about normal.



The tuna industry is already making plans to market its big catch and pack. A big promotional campaign, in which the industry and the U. S. Fish and Wildlife Service will join forces, has been planned and the period September 13-22 has been designated as National Tuna Week.

The new pack of Alaska salmon will make its appearance on the American market in mid-August. Indications are that the total salmon pack this year will be about the same as that of 1955 which was below average. Landings of Columbia River and Alaska king (chinook) salmon have met with a ready market, whether the salmon was fresh or frozen. The early Columbia River chinook salmon pack was quickly sold.

The Maine sardine industry got off to a slow start in June but most of the activity in that fishery is in this summer quarter. Historically the even-numbered years have been the big productive periods. Production of California sardines will begin in the fourth quarter.

Groundfish landings are expected to maintain the high level of the second quarter, although there will be a reduction in the catch of cod. Haddock stocks are about 25 percent greater than they were a year ago. Ocean perch landings which have been down somewhat are expected to increase.

Fresh-water fish landings have passed their seasonal peak.

Soft-clam production was low in Maine but the surf-clam harvest is 50 percent above the 1955 mark in the Middle Atlantic States. Hard crabs are plentiful in the Gulf and production is expected to reach a seasonal peak in Chesapeake Bay during this quarter. The oyster season on the Atlantic Coast opens in September. Sea scallops will reach a production peak in July and August.

There will be increases in the output of fish oil and fish meal and the year's output of each is expected to be about the same as that of last year, which set a record high.

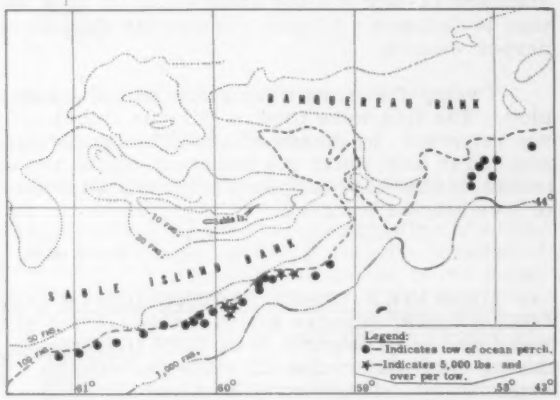
North Atlantic Fisheries Exploration and Gear Research

SMALLER CATCHES OF DEEP-WATER OCEAN PERCH MADE AT EDGE OF CONTINENTAL SHELF BY "DELAWARE" (Cruise 20): Five one-hour tows in deep water at the edge of the Continental Shelf in the vicinity of Sable Island, Nova Scotia, yielded ocean perch catches ranging from 5,000 to 8,000 pounds per one-hour tow during cruise 20 (May 21-June 2) of the Service's exploratory fishing vessel Delaware.

The objective of the trip was to check the availability at this season of the year of ocean perch in deep water at the edge of the Continental Shelf.

Tows during this trip were made in areas which had produced large catches of ocean perch on a previous cruise, up to 20,000 pounds a tow.

A total of 30 one-hour tows was made, in the 150- to 350-fathom depth range. The greatest catches were made on the 240-fathom contour.



M/V Delaware Cruise 20 (May 21-June 2, 1956).

A standard No. 41 trawl was used. Damage to nets was frequent. On 12 of the 30 tows, varying amounts of damage was inflicted to the net by rough bottom.

Average weight of the ocean perch caught was 1.1 pounds, with the largest fish being taken in the western portion of the operating area.

Scallop exploration and antibiotic ice experiments will occupy the Delaware during Cruise 21, which was scheduled to depart East Boston on June 11. Areas between the 50- and 100-fathom curves at the southern part of Georges Bank were to be explored for scallops, and groundfish samples for antibiotic ice experiments were to be taken.

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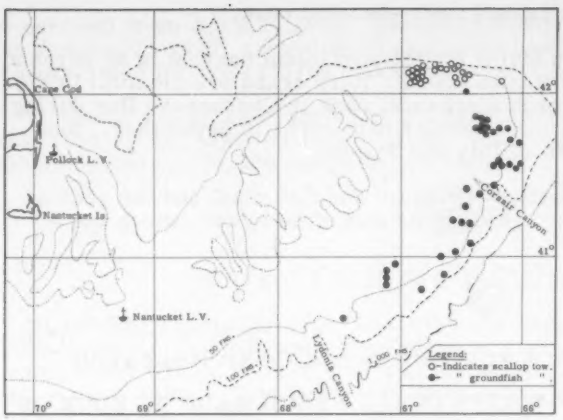
SEA SCALLOPS SOUGHT IN DEEP-WATER AND GROUNDFISH SAMPLES COLLECTED (M/V "DELAWARE," Cruise 21): Complete absence of scallops from bottoms deeper than 55 fathoms was an exploratory finding of Cruise 21 of M/V Dela-



M/V Delaware Cruise 21 (June 11-22, 1956).

aware. The 12-day trip ended with return of the Service's exploratory fishing vessel to East Boston on June 22.

The mission of the trip was twofold: the first half of the trip was devoted to exploration for scallops in the 50- to 100-fathom depth range in the vicinity of Georges Bank: the second half of the trip was used in obtaining samples of groundfish (haddock and cod) for antibiotic ice experiments being conducted by the Service's Boston Fishery Technological Laboratory.

Thirty-seven scallop drags were made in successively deeper water, outward from known productive scallop bottoms. The gear used was a standard 11-foot scallop dredge. In no case were scallops taken from depths deeper than 55 fathoms. Of interest was the abundance of fossil ocean quahog shells in deeper waters.

Twenty-five tows were made with a standard No. 41 trawl for groundfish samples. The fish were iced in various chemical ices, and temperatures during storage recorded by means of a multistage potentiometer. Cooling rates of haddock and cod in salt-water ice and fresh-water ice were obtained. The samples, when landed, will undergo organoleptic tests in order that data on storage in various types of ices may be obtained.

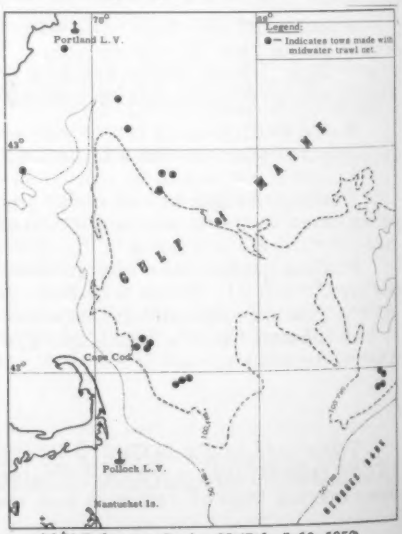
* * * * *

MIDWATER TRAWL FISHING-DEPTH CONTROL FOUND FEASIBLE BY M/V "DELAWARE" (Cruise 22): Postive control of the fishing depth of a midwater trawl was found to be feasible from M/V Delaware during the 9-day cruise 22. The Service's exploratory fishing vessel terminated its trip at East Boston on July 13.

The mission of the trip was to develop methods for handling middepth trawls from the side of the vessel, Atlantic Coast style, and to gain experience in controlling the depth at which the net fished.

Gear used were two midwater trawls developed by the Service's Gear Research Station at Coral Gables, Fla. Both trawls are of nylon mesh, $4\frac{1}{2}$ inches in the bodies, and $3\frac{1}{2}$ inches in the cod end. Of box-type construction, the headrope is equipped with aluminum floats and the footrope with steel depressors at each corner. Spread to the net opening is provided by hydroflow doors.

Once in the water, a constant signal giving the depth of the net is provided by



M/V Delaware Cruise 22 (July 5-13, 1956).

a telemeter device, developed by the Coral Gables Group.

In this fashion, using variations in vessel speed and length of towing wire, it was found possible to precisely control the depth of the net.

Future cruises are planned in which attempts will be made to apply this gear and technique to the capture of ocean perch.

The Service's research vessel Delaware.

M/V Delaware was scheduled to depart on July 23, 1956, for joint operations with M/V Albatross III. Mission of the operations will be to provide data on the efficiency of a "balloon" trawl in catching groundfish, compared with the efficiency of the standard No. 41 trawl.

Marketing Prospects for Edible Fishery Products, July-September 1956

Civilian consumption of fishery products per person during the third quarter 1956 in the United States is expected to be a little lower than a year earlier, and retail prices somewhat higher. Through mid-1956, civilian consumption of edible fishery products has been at a lower rate than a year earlier primarily because of the small reductions in the packing of both canned fish and frozen fish sticks. Retail prices through mid-1956, judging from wholesale prices in major markets, averaged much higher than in the same period of 1955.

Commercial landings through June were substantially larger than a year earlier. The large increase in the catch of tuna and Pacific mackerel (which are used mainly for canning) more than offset the indicated small drop in the landings of species usually sold fresh or frozen.

Commercial freezings of edible fishery products in the United States during the first half of 1956 were slightly smaller than a year earlier. Although freezings will continue to increase seasonally during the summer months, for the year as a whole they are not expected to exceed those in 1955. Cold-storage holdings on July 1 were slightly lower than on the same date last year. Stocks of frozen products will increase during the remainder of the year as supplies are built up for distribution next winter when commercial fishing operations will be at the seasonal low point.

Through April, imports of fishery products, other than frozen tuna for canning, were much higher than in the same period of last year. Receipts of the major canned commodities were up by a third, and of the important fresh and frozen items by more than one-sixth. Sharp increases occurred for both canned salmon and fresh and frozen shrimp.

Exports of the important types of canned fish were a little lower than in the four months of 1955, with the increase for canned California sardines (pilchards) almost offsetting the large decline for canned salmon.

The analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's July 27, 1956 release of The National Food Situation (NFS-77).

North Atlantic Fisheries Investigations

HADDOCK EGGS AND LARVAE DISTRIBUTION SURVEY CONTINUED BY "ALBATROSS III" (Cruise 76): The distribution of haddock eggs and larvae, temperature and salinity, and the general circulation pattern of the Gulf of Maine and Georges Bank area were studied during a 13-day cruise (June 11-24) by the Service's research vessel Albatross III.

The Service's research vessel Albatross III.

During the cruise approximately 3,100 miles of continuous plankton tows were made at the surface and 10 meters with Hardy Plankton Recorders; 275 bathythermograph lowerings, 137 salinity samples, and 25 surface tows with the standard meter net were made. Samples of eggs were hatched out for identification purposes and a total of 1,140 drift bottles were released throughout the area.

Cusk, hake, yellowtail, rockling, gray sole, cunner, and whiting eggs; haddock, cod, pollock, hake, ocean perch, herring, rockling, gray sole, lumpfish, pilotfish, and threespine stickleback larvae were found. No haddock larvae were found off Long Island as in May, but a few were found over the southeast part of Georges Bank.

The Albatross III was scheduled to sail July 5 for Georges Bank to collect data on the distribution and density of sea scallops by means of dredging and underwater photography. All scallops taken were to be tagged and returned to the water.

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NEW FISHERIES RESEARCH VESSEL SHAKEDOWN CRUISE (T-79, Cruise 1): This was a shakedown cruise to test the suitability of T-79 as a fisheries research vessel, to test the fishing gear and hauling equipment, and to tag haddock. "Small Mussels" (18 miles southeast of Pollock Rip light vessel) was the area of operations.

Three sets were made, each consisting of one tub of line-trawl gear. The bait used was chopped frozen herring. A power gurdy was used to haul the trawl aboard.

This was the first research cruise aboard T-79 and the vessel was found to be adequate for line-trawling and fish-tagging purposes. The deck space is ample enough to permit safe comfortable areas for setting and hauling the gear and for the tagging operation. The trawl gear and hauling equipment worked satisfactorily.

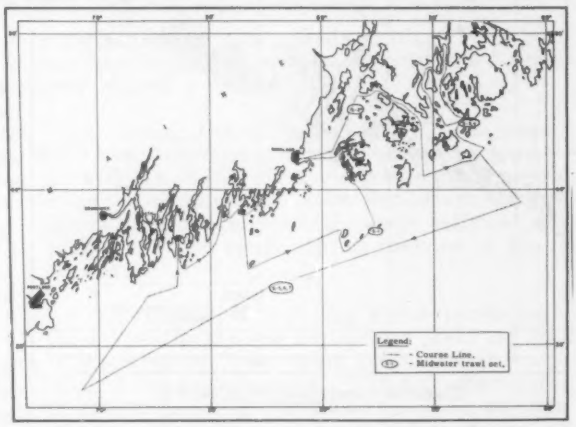
A total of 65 scrod and large haddock were tagged through the gill cover with Petersen disc tags. Both yellow- and white-numbered discs were used. The tags were fastened with stainless-steel tagging pins.

Haddock were not abundant in the area at this time so that many of the hooks came up with no fish. About 15 cod were caught and subsequently released.

Another cruise aboard T-79 was planned about June 25 for the purpose of tagging haddock in the Gulf of Maine.

North Atlantic Herring Research

FISH-FINDER SOUNDINGS BY M/V "METACOMET" LOCATE HERRING (Cruise 2): Continuous soundings to locate herring, recording continuous surface temperatures, bathythermograph casts, and eight experimental sets with the Canadian-type midwater trawl were the objectives of cruise 2 (May 30-June 6) of the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel. Five days of heavy fog curtailed operations.



U. S. Fish and Wildlife Service Cruise 2 of Chartered M/V Metacomet.

Scattered schools of fish believed to be herring were observed off Pemaquid Point and at the entrance to Friendship Harbor on May 30. A good showing of fish that made sounder markings characteristic of herring brit were sounded in the St. George River on May 31 and scattered schools were observed on the same date between Monhegan Island and Matinicus Island. A few scattered schools of fish were sounded in North Haven Harbor, near Cape Rosier, and in Eggemoggin Reach on June 1. Also, one set of the trawl was made on fish near Cape Rosier, catching a small number of brit averaging approximately 2 inches in length.

June 2, 3, and 4 were spent in Blue Hill Bay. Small schools of fish on the bottom were observed near Long Island, Placentia Island, and in Union River during this period. Two sets of the midwater trawl here failed due to improper operation of one trawl door.

On June 5 and 6 soundings were made from Blue Hill Bay to Mt. Desert Rock, to Matinicus Island, to Monhegan Island, to 10 miles southwest of Portland Lightship, and to Boothbay Harbor. Very good showings of fish were recorded at 69° 4.5' W. longitude and 43° 40' N. latitude near Monhegan Island the night of June 5 at depths of from 20 to 75 feet and at the entrance to Boothbay Harbor on June 6.

The method of putting the trawl off the stern and towing from this position worked well but the doors did not work as they should at any time. Further work will be carried on to correct them.

Cruise 3 of the Metacomet was scheduled for June 13-22. The more eastward part of the Coast of Maine was to be worked first and most throughly on this cruise since heavy fogs prevented operations in that area during cruise 2. A radar set was installed on the Metacomet between the two cruises to combat the fog problem.

The fishing gear aboard on this cruise includes gill nets, a lampara seine, and a midwater trawl. It was hoped that with these three types of gear aboard any substantial bodies of fish located may be sampled.

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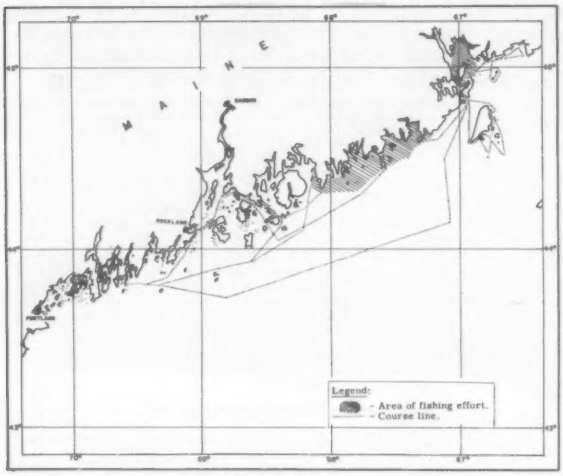
FISH-FINDER SOUNDINGS OFF MAINE AND CANADA BY M/V "METACOMET" (Cruise 3): Fishing and fish-finder soundings were carried out along the eastern part of the coast of Maine from Boothbay Harbor to Eastport by the M/V Metacomet, a Fish and Wildlife Service chartered exploratory fishing vessel. Similar work was done in the Canadian waters of Passamaquoddy Bay (St. Andrews Bay) around Grand Manan Island and in the Bay of Fundy near the Wolves Islands and along the North Shore to Cape Mace.



Chartered vessel Metacomet (Cruise 3).

The major part of the cruise was spent in the area east of Frenchmans Bay. This plan of operation was followed in an attempt to gain more knowledge of the occurrence of herring in the areas where sardine-size fish were still relatively scarce or unreported at the time of the cruise. The cruise was made in two parts; June 14 through 22 and June 25 through 29.

The areas shaded on the diagram were fished with herring gill nets and a British Columbia-type midwater trawl. Small numbers of sardine-size herring were caught in the gill nets in St. Andrews Bay and in Machias Bay. Two catches of smaller herring averaging 4.7 and 4.1 inches, respectively, in standard length were made with the midwater trawl in St. Andrews Bay. Herring brit with average lengths of 2 to 2½ inches were located with fish finder and sampled in nearly all of the shaded area.

During this cruise an aerial survey was made in the area from Machias Bay to Cape Mace, including Grand Manan Island and all of Passamaquoddy Bay. A series of 6 flights was made, 2 in the early morning hours and 4 in the evening, in an effort to locate schools of herring. Although the major part of this area was covered in each of the flights no schools of herring were located.

Cruise No. 4 of the Metacomet was scheduled for July 9-18. Coastal and inshore waters of the Gulf of Maine between Casco Bay and the Bay of Fundy were to be sounded with the fish finder and fished with gill nets and midwater trawl gear. This work was to be augmented with aerial work as during cruise 3, weather permitting.

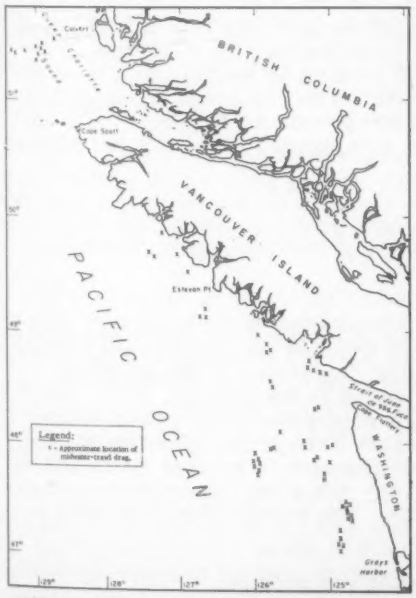
North Pacific Exploratory Fishery Program

PROMISING RESULTS WITH MIDWATER TRAWLS BY "JOHN N. COBB" (Cruise 27): Some promising results in offshore midwater trawling were obtained on a 6-week cruise by the Service's exploratory fishing vessel John N. Cobb, which returned to Seattle on June 22. More than 20 species of fish were caught in the midwater trawls from the Washington coast to northern Vancouver Island.

The John N. Cobb, a vessel operated by the Service's Branch of Commercial Fisheries, is conducting exploratory fishing in the North Pacific.

Fishing from near the surface to within a few feet of the bottom, the vessel's mid-water trawl took mixed catches up to 5,500 pounds in 20 minutes. Largest catches were predominately hake, black rockfish, and dogfish. In one 2-hour tow with the trawl at 37 fathoms in water depths of 62-70 fathoms, the catch included 1,100 pounds of black rockfish and 320 pounds of hake. Up to 1,800 pounds of dogfish were taken with the Canadian midwater herring trawl off Vancouver Island.

Smaller amounts of lingcod, herring, smelt, Pacific ocean perch, and other less important commercial species were also taken on a number of tows. A surprising catch of pink shrimp was made in midwater at night off northern Vancouver Island. Many tows caught nothing except jellyfish and plankton which caught in the meshes of the trawls.



M/V John N. Cobb Cruise No. 27 (May-June 1956).

Gear experts from the Fisheries Research Board of Canada and a biologist from the State of Washington Department of Fisheries cooperated in the experiments. The Canadian nylon midwater herring trawl was used in a number of tows along the west coast of Vancouver Island. No sizable schools of herring were located, and the best catch was 10 pounds of herring. Two nylon midwater trawls, with 40-foot and 50-foot square openings, made at the Service's Gear Research Station at Coral Gables, Fla., were used for the remainder of the 66 tows completed during the trip. These trawls had $4\frac{1}{2}$-inch mesh in the bodies and $3\frac{1}{2}$-inch mesh in the cod ends. After a few days of experience and with some modifications to the trawls and trawl doors, all gear operated satisfactorily in the offshore waters, even in fairly choppy seas.

Depth of the trawl was determined at all times with the telemeter which was developed especially for this work at the University of Miami Marine Laboratory. The instrument was attached to the trawl cable just ahead of the port door. Depth signals were received from the telemeter through a hydrophone, and the trawl was either raised or lowered to the desired depth by adjusting the amount of cable out

or the speed of the vessel. Greatest depth fished was 210 fathoms off the Washington coast in 800 fathoms of water.

A "Sea Scanar" and a recording depth sounder were used to locate schools of fish in midwater. "Blind" tows, made with no indication of fish on either instrument, usually resulted in no catch. Some success was obtained in correlating catches with echoes received on the instruments, but in some instances catches were poor even with good echo indications of fish. It was apparent that an electronic fish finder is essential to successful offshore midwater trawling, but extensive experience will be required for the operator to be able to identify species shown by different types of echoes.

Oregon

TRAWLING REGULATIONS REVISED: Two changes in regulations effective June 20, governing commercial fishing for various ocean fishes in Oregon coastal waters, have been adopted by the Oregon Fish Commission, according to the State Fisheries Director.

In accordance with one change, only otter-trawl nets of a mesh size of three inches or less or $4\frac{1}{2}$ inches or greater, stretched measure between knots, will be lawful. The new mesh sizes have been installed to provide maximum protection for small-size Dover, English, and petrale sole and still allow a legal harvest of Pacific ocean perch. The ocean perch gill badly and are difficult to remove from larger size mesh.

An additional revision of ocean fishing regulations provides that the incidental catch of Dover, English, and petrale sole, prohibited for use for reduction or as animal food, shall not exceed 2,000 pounds or 20 percent by weight, whichever is the greater, of a single landing, sale, or purchase. The regulation formerly limited the incidental catch of the three species to 2,000 pounds or 20 percent of a single trip or fare. The Director said the revision was adopted primarily to facilitate enforcement of the incidental catch regulation.

Oysters

REGULATIONS ADOPTED BY NATIONAL CONFERENCE OF WEIGHTS AND MEASURES: Regulations which apply to the fresh shucked and canned oyster trade were adopted by the National Conference of Weights and Measures at the annual meeting in Washington, D.C., the last week in May 1956. These are the first regulations for the oyster industry which have been promulgated by this body. Automatically they become effective in several states and the recommendations of this body are given favorable consideration generally in the others. The regulations as adopted follow:

Shucking oysters.

Oysters shall be classified in two groups.

Group (1). Raw or Fresh Oysters--Raw or fresh oysters in tins, glass, or other containers, shall be sold by avoirdupois net weight or liquid measure, and the package shall not contain more than 10 percent liquid at 45° F. Any tests made to determine the quantity of contents in a package shall consist of enough packages to total at least 1 gallon.

Group (2). Canned Oysters that are Heat Treated and Hermetically Sealed--Canned oysters that are heat treated and hermetically sealed shall be sold by avoirdupois net weight, and the drained weight of the oysters in each container shall not be less than 59 percent of the declared net weight of the contents of the package.

The oyster industry recommends the following method be used, in the field, to determine the free liquid content of raw or shucked oysters.

"Open the container and, without pressure against the oysters in the container, drain for a period of one minute into a glass graduate, and from this procedure determine the amount of liquid so drained from the container.

"Since raw oysters are subject to changes in the pH value, due either to improper refrigeration or age, the use of a pH Comparator will determine any such changes. If the pH of the oysters reaches a pH of 5.8 or less, the free liquid content should not be determined."

Pacific Oceanic Fishery Investigations

ALBACORE TUNA TAGGED ON JAPANESE FISHING GROUNDS: Two U. S. Fish and Wildlife Service investigators recently returned to Hawaii from Japan, where they carried out albacore tagging work in cooperation with Japanese fisheries research agencies. The two Service investigators arrived on May 16 in Tokyo, where they were put in touch with the various local research agencies actively engaged in the albacore tuna fishery. The Mie Prefecture Fisheries Experiment Station appeared most interested in participating in the albacore tagging program proposed by the Americans, and after a visit to the Station, at Hamajima in Mie Prefecture, and conferences with its director, a contract was concluded which made it possible to tag and release albacore from the Station's 200-ton "fisheries guidance vessel" Jini Maru.

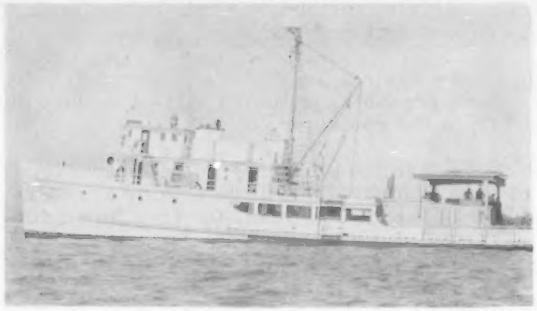
Two tagging cruises were made, the first departing from Shimizu on May 29 and returning to the same port on June 8; the second departing Shimizu on June 9 and returning to Misaki on June 21. A total of 270 albacore were released with numbered tags of plastic tubing tied through the skin and muscles of their backs. The weight of the marked fish averaged about 20 pounds each.

The objective of such tagging experiments is to clarify the apparently wide-ranging but little understood migrations of this commercially-valuable "white meat" tuna species. Albacore marked with similar tags off the California coast and to the north of Hawaii have been recaptured by Japanese fishermen off the coast of Japan and in the open Pacific near Midway Island. It is hoped that recaptures of tagged tuna released within 500 miles of the Japanese coast from the Jini Maru may show whether or not there is a return migration of this species across the Pacific from west to east.

A secondary objective of the cooperative venture was to introduce the American tuna tagging method to Japan and to interest the Japanese in carrying on similar work independently in the future. It is anticipated that in the coming year the Japanese Fisheries Agency, through its Nankai Regional Fisheries Research Laboratory, will encourage and coordinate tuna tagging experiments by prefectural and other local research organizations. Large-scale tagging programs will also be carried out in the central Pacific and on the American west coast by American agencies in a concerted Pacific-wide effort to shed some light on the mysterious movements of this valuable commercial fishery resource.

* * * * *

HAWAII SKIPJACK FISHING GROUNDS SURVEY COMPLETED BY "HUGH M. SMITH" (Cruise 34): A two-month oceanographic and fishing survey in Hawaiian waters was completed when the Service's research vessel Hugh M. Smith returned to Honolulu on June 30. The cruise was part of an intensive investigation being made to determine reasons for the fluctuations in catches of skipjack tuna (aku) from year to year and to learn why catches of skipjack are high in some localities and low in others. During the cruise collections were made on 3 different occasions to study variations in the amount of plankton present during the period of the cruise and also to compare the abundance of plankton now with that at other times of the year. Water temperatures were recorded and sea-water samples collected for chemical analysis at a series of oceanographic stations occupied twice during the cruise. Information gained from analyses of these data will aid in determining the variations in water flow through the island area which in turn may be associated with abundance of aku.



The Service's research vessel Hugh M. Smith.

In addition to the study of the environment, plastic tags were placed on 200 skipjack as part of a two-fold project to learn more of the migrations of skipjack and to devise better methods of tagging. Part of the fish were tagged and released about 120 miles to the north of Oahu while the remainder were tagged and released in waters adjacent to Oahu and Lanai. Some of the aku were tagged with a standard type tag while others were tagged with a new tag developed by Service biologists. Recovery of these tagged fish by local fishermen will furnish information as to migrations and growth of the skipjack and the suitability of the new tag. When operating within range of the local skipjack boats, radio broadcasts were made twice daily

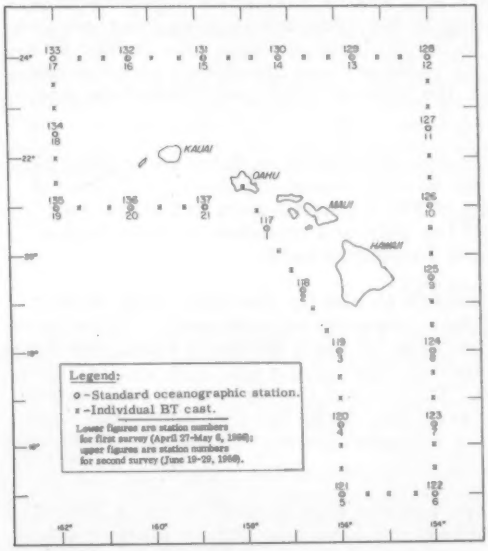

KAUAI
OAHU
MAUI
HAWAII
Legend:
o - Standard oceanographic station.
x - Individual BT cast.
Lower figures are station numbers for first survey (April 27-May 6, 1956); upper figures are station numbers for second survey (June 19-29, 1956).

Fig. 1 - Hugh M. Smith Cruise 34 (April 27-June 30, 1956).

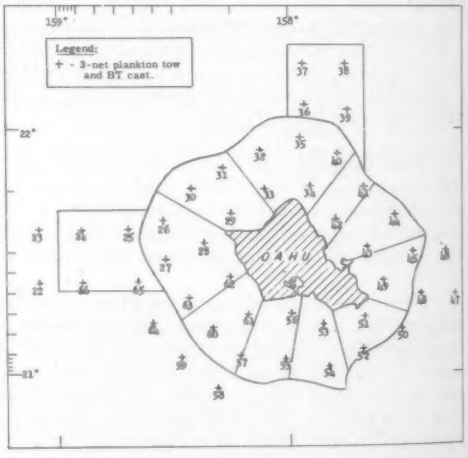


Fig. 2 - Hugh M. Smith Cruise 34 (April 27 - June 30, 1956).

to inform fishermen of the presence of fish schools sighted by the Hugh M. Smith. Moderate numbers of schools of both large and small skipjack were observed, but many of the schools were wild and difficult to fish.

Two skipjack scouting trips were made to the north of Oahu and one to the south (fig. 4). A total of 4 days was spent scouting beyond 100 miles north of Oahu. Fifteen bird-accompanied fish schools were observed of which 8 were identified as skipjack. A total of 103 16- to 20-pound skipjack and 2- to 3-pound skipjack were caught and of these 36 large and 42 small skipjack were tagged. In the southern area during 2 days of scouting 18 flocks were observed and 5 of these were identified as skipjack. No fish were caught during this period (May 14 to 28); 6 days were spent in fishing for bait with a total bait catch of 273 buckets of nehu.

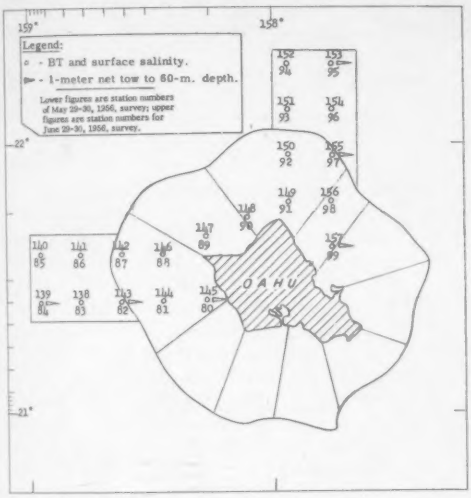

Legend:
- BT and surface salinity.
- 1-meter net tow to 60-m. depth.
Lower figures are station numbers of May 29-30, 1956, survey; upper figures are station numbers for June 29-30, 1956, survey.
OAHU
159°
158°
22°
21°

Fig. 3 - Hugh M. Smith Cruise 34 (April 27-June 30, 1956).

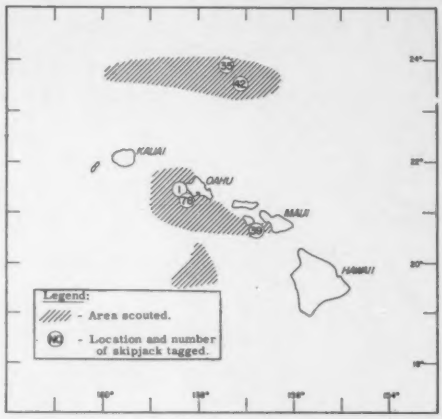


Fig. 4 - Hugh M. Smith Cruise 34 (April 27- June 30, 1956).

During 7 days of scouting in waters adjacent to Oahu, Molokai, and Lanai (fig. 4) 44 bird-accompanied schools were observed and 12 of these were identified as skipjack schools. A total of 139 skipjack were caught and 118 of these were tagged and released. Experimental all-plastic dart tags were placed on 45, blue California-type G tags on 37, and white California-type G tags on 36 skipjack. One fish tagged with a dart tag weighed 20 pounds, the remaining 117 averaged 5 pounds in weight. Fishing and scouting for bait took 10 days during the period June 1 to 17 with a bait catch of 276 buckets of nehu.

* * * * *

SKIPJACK TUNA BEHAVIOR IN HAWAIIAN WATERS STUDIED BY "CHARLES H. GILBERT" (Cruise 28): To determine why some skipjack (aku) tuna schools can be fished more successfully than others, the Service's research vessel Charles H. Gilbert studied the feeding reactions and the movements of the various schools encountered in Hawaiian waters. After a two-week cruise, the vessel returned to Honolulu on June 5.

The newly-installed "Scanar" was tested during this cruise. This electronic fish finder, which works like underwater radar, returned positive signals from 5 skipjack schools and suspected signals from 10 schools. One school was detected at a distance of 1,200 feet. With greater experience in the interpretation and identification of the echo signals, it is hoped that the "Scanar" will not only reveal the

presence of tuna schools below the surface at some distance from the ship, but that it will also facilitate a study of their movements and behavior.

The vessel spent 10 full days of scouting during which 21 skipjack schools were seen. The schools were unusually wild and sample catches were made only with difficulty. One phase of this work is to see if there is any relationship between the "biting quality" of the school and the kind and quantity of natural food in the stomachs of the fish.

Two other vessels of the Pacific Oceanic Fishery Investigations are also studying the behavior, migration, and abundance of skipjack in an effort to aid the local fishermen. The principal effort of these two vessels is to tag the skipjack and thus trace their movements into the Hawaiian fishery.

* * * * *

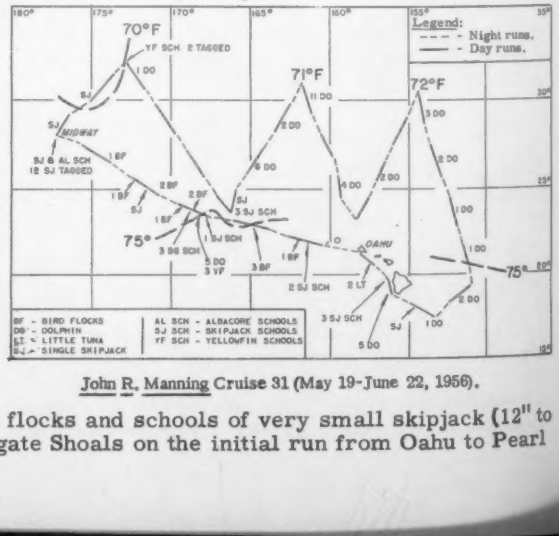
SECOND SPRING SKIPJACK SCOUTING CRUISE COMPLETED BY "JOHN R. MANNING" (Cruise 31): The capture of two large albacore tuna trolling through a mixed school of albacore and skipjack highlighted this cruise of the Service's research vessel John R. Manning. This mixed school was found just a few miles from Midway. A total of 26 skipjack were caught of which 12 were tagged and released. The two albacore caught are the largest ever caught on trolling lines by the Pacific Oceanic Fishery Investigations. The vessel returned to port on June 22 after five weeks of skipjack scouting in the waters north of the Leeward Islands.

John R. Manning, one of the three research vessels of the Pacific Oceanic Fishery Investigations, at Pearl Harbor.

Additional schools of skipjack were found south and west of French Frigate Shoals. A school of yellowfin tuna was found northwest of Midway and two of seven fish caught were tagged and released.

A survey of bait fish at Pearl and Hermes Reef, Midway and French Frigate Shoals showed a scarcity of iao or silversides, but fair numbers of small aholehole.

A census of Hawaiian monk seals showed an increase in pups at Pearl and Hermes where 108 adults and 25 pups were counted. At Midway, 10 adults and 5 pups were seen and at French Frigate Shoals, 18 adults and 10 pups were counted.



John R. Manning Cruise 31 (May 19-June 22, 1956).

Direct trolling with 6 lines showed a lack of skipjack tuna in the waters north of the Leeward Islands but a concentration of bird flocks and schools of very small skipjack (12" to 15") south and west of French Frigate Shoals on the initial run from Oahu to Pearl

and Hermes Reef. Six identified schools and 11 bird flocks were seen on that run. In addition, a mixed school of dolphin and yellowfin was found about 150 miles southwest of French Frigate Shoals. A mixed school of skipjack (6-8 pounds) and albacore was found just off Midway. Two albacore of 42 and 48 pounds each were caught on the trolling lines, one got off and one was hooked on a pole but escaped. These albacore are the largest taken on trolling lines by POFI and the first to be hooked by a pole fisherman. The thermocline was extremely shallow in this area (10-20 ft.) which may account for the presence at the surface of these large albacore. Three schools of very small skipjack were seen inside the lagoon at French Frigate Shoals. Single skipjack were caught or hooked northeast of Midway and again north of French Frigate Shoals and south of Hawaii. A school of yellowfin was encountered at 32°03' N., 172°39' W. in water of about 70° F. Dolphin were common east of 165° W.

No significant amounts of bait fish were seen at Pearl and Hermes Reef. Scattered schools of 3 to 6 buckets of iao (P. insularum) and aholehole (K. sandvicensis) occurred at Southeast and Sand Islands. A few buckets of small mullet were seen at North Island. At Midway, 55 buckets of iao were found and caught at East Island. In addition, about 110 buckets of small aholehole and over 500 buckets of small goatfish (Mullidae) were seen at East Island and the adjacent sand bars. Around Sand Island, only scattered schools of aholehole (175 buckets), piha (S. delicatulus) (105 buckets) and iao (10 buckets) were seen. At French Frigate Shoals, 23 buckets of iao were seen of which 18 were captured, at East Island. In addition, 31 buckets of iao were seen at Gin and Little Gin. Small samples of iao and aholehole were taken for length frequency and maturity studies, when possible.

Twelve out of 26 skipjack caught off Midway were tagged with blue California-type G tags. Two yellowfin from the school northeast of Midway were also tagged.

Public Eating Places Survey

PUBLICIZING BENEFICIAL QUALITIES OF FISHERY PRODUCTS BELIEVED DESIRABLE: According to the results of a scientific sample survey of 4,500 establishments representing all public eating places in the United States, it was found that 52 percent of the managers or operators of public eating places serving fish and shellfish felt that an educational program pointing out the beneficial values of fish and shellfish would definitely help them to increase sales of fishery products, while only 26 percent expressed doubt as to the usefulness of such a promotional effort, and 22 percent expressed no opinion.

Number of Establishments Serving Fishery Products Indicating Opinion as to Whether Publicizing Beneficial Qualities Would Sell More Fish and Shellfish, by Geographic Region

	Total	Would		Would Not		Don't Know		No Reply	
	Number	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States Totals	208,100	107,800	51.8	54,600	26.2	43,600	21.0	2,100	1.0
By Regions:									
Northeast	68,000	34,400	50.6	18,900	27.8	14,400	21.2	300	0.4
North Central . .	59,700	29,900	50.1	16,800	28.1	12,100	20.3	900	1.5
South	45,900	25,000	54.5	10,300	22.4	9,900	21.6	700	1.5
West	34,500	18,500	53.6	8,600	24.9	7,200	20.9	200	0.6

There are 208,000 public eating places in the United States which serve fish and shellfish. Operators of eating places are particularly interested in increasing their sales of fish since, in the opinion of a majority of them, there is as much or more profit from a serving of fish and shellfish as from a serving of other high protein items such as steak, roast beef, or chicken.

Final results of the survey, which is being financed by funds made available under the Saltonstall-Kennedy Act of 1954, are scheduled for publication this year.

Saltonstall-Kennedy Act Fisheries Projects

SHRIMP, SPONGE, AND TUNA PROBLEMS RESEARCH CONTRACTS AWARDED: Three research contracts for projects to study problems in the tuna, shrimp, and sponge industries were recently awarded by the Fish and Wildlife Service, Secretary of the Interior Fred A. Seaton said July 7. The work is part of the Saltonstall-Kennedy program to increase production and markets in the domestic fishing industry.

Two of the projects, one an investigation of Florida commercial sponges and the other an investigation of the causes and prevention of "black spot" on shrimp, will be conducted by the Marine Laboratory of the University of Miami. The third, an oceanographic investigation of the eastern tropical Pacific Ocean for the benefit of the tuna industry, will be made by the Scripps Institution of Oceanography of La Jolla, Calif.

The scene of the oceanographic study, the tropical Pacific west of Central America, is the big fishing area for the American tuna fleet. The purpose of the study is to make it possible to forecast the time and area for good tuna fishing and so provide a scientific basis for increasing the efficiency of the tuna fishery.

Since tuna presence and abundance is dependent to a great extent upon food supply, and since plankton, which is the chief direct or indirect food source for ocean fish, is affected by water conditions, the many phenomena which affect water conditions will come within the scope of the study.

Among the things which bring about the fluctuations in the abundance of plankton are the chemical nutrients brought to the surface by "upwelling" of water from the lower reaches of the ocean and by the retention of fertile water in the "interface" between ocean currents. Hence the waters of the Baja California, Tehuantepec, and Panama upwellings and the interface between the Peru Current and the Gulf of Panama water will be subject to various physical and chemical examinations. The behavior and the relationship of tuna to the changes in water conditions will also be studied. The contract price with the Scripps Institution for an initial phase of the study is $35,000.

"Black spot" in shrimp is a condition which became evident when shrimp fishermen began operations in shrimping areas located several days offshore in the Gulf of Mexico. While black spot carries no health hazards it does tend to lower the consumer acceptability of the product and to lower its value accordingly. The condition does not appear in the shrimp which are taken close to the Gulf ports and which are utilized within two or three days.

When black spot appears it is after the uncooked shrimp have been on ice for several days. In an effort to learn when it occurs and exactly what is the contributing factor to this condition, technologists will study every phase of the shrimp operations from the time the shrimp are caught until they are ready for use. The contract price with the University of Miami for this work is $19,900.

The sponge research contract with the University of Miami is for $12,000. It is an extension of a $20,000 contract negotiated last year. This is a general investigation of the Florida commercial sponge resource. Specific attention is to be paid to the location and extent of the grounds, distribution, rate of reproduction and growth, the effect of nonselective harvesting, the effectiveness of the Federal minimum-size law, environmental factors, and sponge diseases.

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CANNED FISH CONSUMER PURCHASES STUDY: Approximately 2,500 housewives in 100 selected counties throughout the United States were scheduled to be interviewed in June in the course of a national consumer survey designed by the U. S. Fish and Wildlife Service to give a cross-section of the purchase pattern of the American housewife with respect to canned fishery products.

The results of the study will be of considerable importance to the domestic fishing and fish-processing industries in fitting their products into the general food tastes and buying habits of the householder, according to the Director of the Fish and Wildlife Service. The study will show whether the marketing practices of a given area are such that the consumers' desires for canned fishery products are satisfied.

Information will be obtained on (1) factors influencing the use or non-use of the various species and types of canned fish and shellfish in the household, (2) opinions and preference of consumers regarding certain characteristics of canned fishery products, and (3) methods of preparing and serving canned fish.

The project is being financed by funds made available by the Saltonstall-Kennedy Act of 1954.

The survey will be conducted under supervision of the Fish and Wildlife Service by W. R. Simmons and Associates Research, Inc., of New York City.

* * * * *

FOREIGN MARKETS FOR UNITED STATES FISH OILS BEING STUDIED: A study of the markets for United States-produced fish oils with emphasis on the Western Europe and North Atlantic countries is being conducted by the U. S. Fish and Wildlife Service with Saltonstall-Kennedy Act funds. The study has two primary objectives:

1. Study the present and potential markets for United States-produced fish oils in Western Europe.
2. Study present and potential foreign fish-oil facilities as they constitute competition to the United States production in these markets.

The present survey is planned to cover Norway, Sweden, Denmark, the Netherlands, Germany, Belgium, France, England, and possibly Switzerland. The survey is being conducted by J. W. Stedman, Chief, Foreign Marketing Branch, Fats and Oils Division, Foreign Agricultural Service, U. S. Department of Agriculture on a cooperative contract with the Fish and Wildlife Service.

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FRESH FISH CONSUMPTION INCREASE SOUGHT IN INLAND UNITED STATES: A three-city study which could be the basis for a broad campaign to increase the consumption of fresh fish and shellfish in inland United States will be made during the coming months, the Director of the U. S. Fish and Wildlife Service announced July 1.

The three cities selected are Nashville, Tenn.; Indianapolis, Ind.; and Portland, Me. Portland was selected for comparative purposes to determine whether results of promotional efforts to expand the market for fresh fish differ in inland and coastal areas. For the purpose of the study fresh fish are defined as those,

dressed or not, which are not frozen, cured, or otherwise preserved. Fish which are simply iced are classified as fresh.

Previous studies have shown that the per capita consumption of fresh fish by persons in areas not adjacent to the sea coasts or to the Great Lakes is lower than that of persons living on the seaboard. The purpose of the study is to attempt to learn in more detail why this is so, and to explore ways and means of increasing the consumption of fresh fish in the inland areas.

Typical retail fresh-fish market.

Wholesalers, retailers, and housewives in the three cities will be questioned during the survey. Promotional campaigns will be discussed with fresh fish distributors and follow-up campaigns will appraise the effectiveness of any promotional efforts.

Information will be obtained on the species of fresh fish and shellfish sold in the stores; the quality of the fish and the amount of waste; the availability of the desired species; methods of handling and taking care of the fish; methods of display; dealers' preferences as to prepackaging; policy on markups; possibility of cooperative advertising and other promotional campaigns; trends in fish sales and the reasons.

In addition to the information which will be obtained from dealers who handle fish, interviews will be held with those who do not handle fresh fish to determine their reasons for not doing so.

Housewives to be interviewed will be primarily those who come to the stores to purchase fresh fish. The interviews will be in the store or at the home by appointment. The housewife will be asked if she is satisfied with the quantity and kind of fish available; the type purchased and the type preferred; suggestions on improvements on quality, display, packaging, dressing or other characteristics or factors; circumstances which might induce the housewife to use more fresh fish. In addition, housewives who do not purchase fresh fish will be interviewed to determine their reasons for not doing so.

The study will be made by the Bureau of Business Research, College of Business Administration, Boston College. Interviewing is scheduled to start October 1 and be completed by December 1. Between now and the start of interviewing, specific plans will be discussed with industry, and questionnaires prepared and pretested. The final report is not due until next spring.

The survey is part of the Saltonstall-Kennedy Act program for increasing production and expanding the market for domestic fishery products.

South Atlantic Exploratory Fishery Program

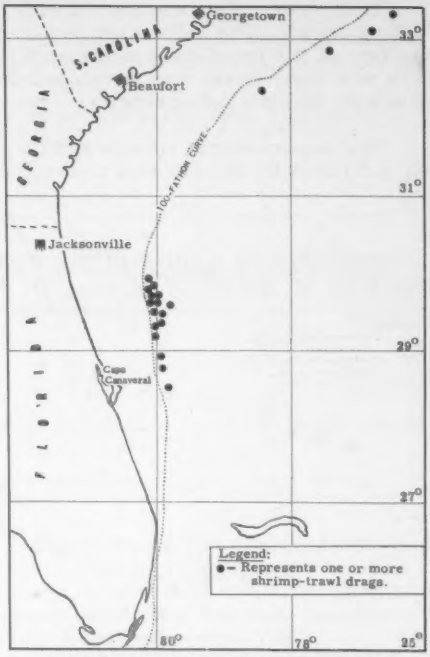
MORE DEEP-WATER RED SHRIMP EXPLORATIONS BY "PELICAN" (Cruise 3): Deep-water exploratory shrimp trawling by the Service's exploratory fishing vessel Pelican during May and June consisted primarily of additional exploratory coverage of the 150- to 225-fathom depth range from Cape Canaveral to St. Augus-

tine, including preliminary work with commercial-scale gear and bottom survey and exploratory trawling north of Jacksonville to Georgetown, S. C.

Twenty-five 4- to 5-hour drags between Cape Canaveral and St. Augustine produced 2,700 pounds of red shrimp (Hymenopenaeus robustus) during the period. The most productive drags were made in the 175- to 212-fathom range southeast of St. Augustine using a 40-foot trawl. Three tows in this area produced 1,020 pounds at a rate of 85 pounds an hour.

There was a complete loss of two commercial rigs, an 86-foot and a 60-foot flat trawl, due to parting of the $\frac{3}{8}$"-diameter towing warp.

The exploratory work in the red shrimp depth range north of Jacksonville revealed untrawlable bottom as far north as Beaufort, S. C. Four drags in the 170- to 250-fathom range from Beaufort north to Georgetown, S. C., produced a few P. megalops, a smaller deep-water shrimp (60-70 count, heads on), but no red shrimp. Bad weather prevented northward continuation of the trip.



Location of exploratory trawling stations by the Service's exploratory fishing vessel, Pelican.

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MIDWATER TRAWLS AND TELEMETERING DEPTH FINDER TESTED BY M/V "GEORGE M. BOWERS" (Cruise 3): Gear-research operations with experimental midwater trawls and with a recently-developed telemetering depth sounder were conducted by the Service's exploratory fishing vessel George M. Bowers April 6-April 19, 1956. These tests were made in offshore Gulf Stream waters between Fort Lauderdale and Key Largo, Fla.

The Service's research vessel George M. Bowers.

Continued research in single-boat midwater-trawling devices by the Service's Gear Research Unit at Coral Gables, Fla., has indicated that practical midwater trawls should be lightweight and strong, easily handled and maneuverable over a range of speeds, and that the trawl depth must be controllable at all times. Systematic investigations and observations of trawl behavior with undersea television and by divers with cameras have resulted in some improved designs. During this cruise a 30-foot cotton trawl and 40- and 50-foot nylon nets were observed to be performing as designed under experimental fishing conditions.

Tests were also conducted with the telemetering depth sounder attached to the 40-foot trawl. The telemeter is a remote depth sounder designed to give accurate position of the trawl over a range of 0-200 fathoms and to one mile in distance. This new instrument was developed under contract to the Service by the University of Miami Marine Laboratory.

The experimental trawls and the telemeter are to be used in exploratory fishing activities by the Service in the Pacific Northwest and in New England waters.

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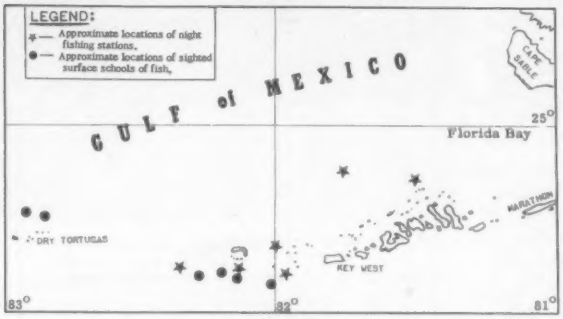
FISHING FOR SARDINELIKE FISH OFF SOUTHERN FLORIDA BY M/V "GEORGE M. BOWERS" (Cruise 4): Scouting and fishing for sardinelike fish in lower Florida Bay and around the Keys south of Marathon were the principal objectives of Cruise 4 (June 12-27) of the Service's exploratory fishing vessel George M. Bowers.



M/V George M. Bowers (Cruise 4).

Samples of sardinelike fish caught on this trip were frozen for technological studies. Anchovies, balao, and other unidentified species were preserved. Ten fishing stations were made at night between Marathon, Fla., and the Dry Tortugas. Harengula, weighing 6 per pound, were caught with a light and trap lift net west of Snipe and Content Keys. Juveniles and small fish, one inch and less, were taken with a light and dip nets southeast of the Marquesas Keys. During daytime-scouting operations sardinelike fish were sighted and taken with a beach seine near the Dry Tortugas. Attempts were made to take surface schools of fish by trawling, but such schools were too wary and broke up or avoided the vessel.

A biologist of the Marine Laboratory of the University of Miami collected data from ten two-hour drags which were made on the Tortugas shrimp grounds. Using a fine mesh cover over the cod-end, shrimp escapement through different sizes of cod-end mesh was determined.

U. S. Fish Stick Production

APRIL-JUNE 1956 PRODUCTION BELOW LAST YEAR: United States production of fish sticks in the second quarter of 1956 totaled 11.3 million pounds, according to Fish Stick Report, April-June 1956 (C. F. S. No. 1380) recently published by the U. S. Fish and Wildlife Service. This was 5.3 million pounds (32 percent)

Table 1 - U. S. Production of Fish Sticks, April-June 1956

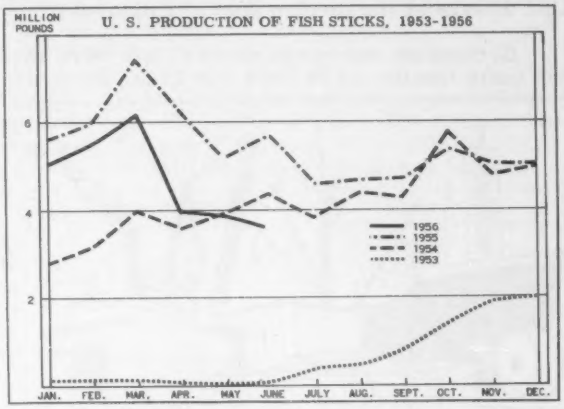
Month	Cooked	Uncooked	Total
	(Million Lbs.)		
April	3.5	0.4	3.9
May	3.4	0.4	3.8
June	3.2	0.4	3.6
Total 2nd Quarter: 1956	10.1	1.2	11.3
1955	15.3	1.8	17.1
Total January-June: 1956	24.8	3.1	27.9
1955	31.8	4.3	36.1

Table 2 - U. S. Fish Stick Production by Areas, April-June 1956

Area	April-June			
	1956		1955	
	Firms	Quantity	Firms	Quantity
	No.	Million Lbs.	No.	Million Lbs.
Atlantic Coast States	27	9.2	28	14.2
Interior and Gulf States	6	1.3	8	1.4
Pacific Coast States	10	0.8	11	1.5
Total	43	11.3	47	17.1

less than the quantity produced during the first quarter of the year and 5.8 million pounds (34 percent) less than the production reported for the corresponding period of 1955.

Production during the second quarter of 1956 averaged 3.8 million pounds a month as compared with an average monthly production of 5.7 million pounds during the second quarter of last year. The largest quantity of fish sticks ever produced during a single month occurred during March 1955 when 7.4 million pounds were packed.



In the second quarter of 1956, 89 percent of the total production was precooked. Uncooked sticks accounted for the remaining 11 percent. During this same quarter, 27 of the 43 producing firms in the United States were located in the Atlantic Coast States and accounted for 9.2 million pounds--82 percent of the total production. Plants located in the interior of the country and in the Gulf States manufactured 1.2 million pounds of fish sticks and firms situated in the Pacific Coast States produced nearly 838,000 pounds.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MARCH 1956: United States imports of edible fresh, frozen, and processed fish and shellfish for March increased about 1.6 percent in quantity, but decreased 2.2 percent in value as compared with February 1956. Compared with March 1955 the imports for March 1956 declined 18.2 percent in quantity and 5.4 percent in value. The dollar value in March 1956 was about 27.9 cents a pound, compared with 24.1 cents a pound in March 1955. Shrimp imports were about 1.5 million pounds higher in March 1956 when compared with March 1955, but the imports of groundfish fillets, canned fish, and salmon were lower.

United States Foreign Trade in Edible Fishery Products, March 1956 with Comparisons

Item	Quantity			Value		
	Mar.		Year	Mar.		Year
	1956	1955	1955	1956	1955	1955
	(Million of Lbs.)			(Million of $)		
Imports:						
Fish & Shellfish: Fresh, frozen & processed1/	62.8	76.7	768.3	17.5	18.5	206.4
Exports:						
Fish & Shellfish: processed1/ only (excluding fresh & frozen)	6.3	7.1	91.0	1.3	1.6	21.8

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

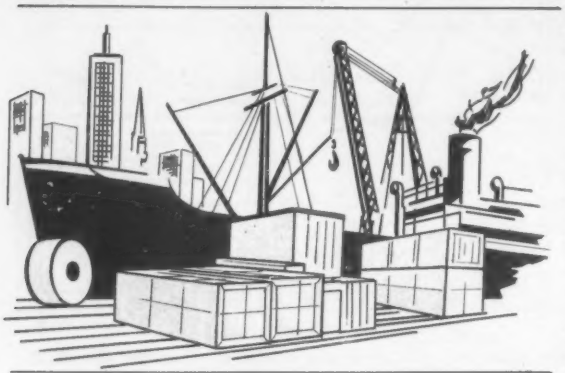
Exports of processed fish and shellfish in March 1956 decreased about 7 percent from the February 1956 total, and were also down 11 percent from March 1955. The value of exports in March 1956 declined 13 percent when compared with February 1956 and 19 percent below March 1955.

* * * * *

FISHERY PRODUCTS IMPORTED FROM MANY COUNTRIES: More countries are now supplying fishery products to United States markets than in former years, according to a review of certain principal fishery products imports made by the U. S. Fish and Wildlife Service.

Shrimp was imported from 26 countries during 1955, compared with 23 countries in 1954. In 1940, 10 countries supplied shrimp to United States markets. Imports of fresh, frozen, canned, and dried shrimp in 1955 were valued at $24.5 million dollars at the foreign port of shipment.

Groundfish and ocean perch fillets were imported from 12 countries in 1955--the same number as in 1954. In 1940, 99 percent of these imports were received from Canada and Newfoundland. Imports of these products during 1955 were valued at almost $25 million f.o.b. foreign ports.



Tuna, in its various forms, came from 21 different countries in 1955. In 1940, 12 countries supplied tuna to the United States. United States imports of tuna were valued at the foreign port of shipment at $33.2 million.

Lobsters, in their various forms, were imported from 28 countries during 1955. In 1954, 23 countries shipped lobsters, but only 10 countries supplied lobsters to the United States in 1940. Lobster imports in 1955 were valued at $35.2 million f.o.b. foreign ports.

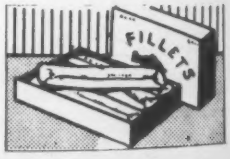
Swordfish came from 6 countries in 1955 as compared with 2 countries in 1940. These imports had a foreign value of $5.4 million.

Crab meat imports originated in 6 countries, about the same as in 1940. Imports were valued at $4.9 million.

In 1955 about 50 different countries contributed to the imports of the commodities shown. Imports of these products during 1955 totaled about 436 million pounds and had a value of $128 million at the foreign point of shipment. In 1940, these same products totaled 66 million pounds at a value of $10.7 million.

* * * * *

GROUNDFISH FILLET IMPORTS DOWN 10 PERCENT IN JUNE 1956: Imports of groundfish (including ocean perch) fillets during June 1956 amounted to 7.5 million pounds as compared with 8.3 million pounds imported during June of last year. This 10-percent decrease was primarily due to a 1.0-million-pound drop in imports from Canada. Imports from Denmark and the Netherlands were also lower. Iceland, France, and West Germany exported somewhat more fillets to the United States during June 1956 than during the same month last year. There were no imports from Sweden, Norway, Japan, Greenland, Miquelon and St. Pierre, and the Union of South Africa during June 1956.



Canada continued as the leading exporter of groundfish fillets to the United States with nearly 6.0 million pounds during June of the current year--79 percent of the month's total fillet imports. Canada accounted for 84 percent of the total fillet imports during the same month last year.

Total groundfish and ocean perch fillet imports during the first half of 1956 amounted to 66.5 million pounds and for the corresponding period last year they

totaled 62.6 million pounds. Canada, with 44.8 million pounds, led all other countries exporting fillets to the United States during January-June 1956, followed by Iceland (15.2 million pounds) and Norway (2.3 million pounds).
Note: See Chart 7 in this issue.

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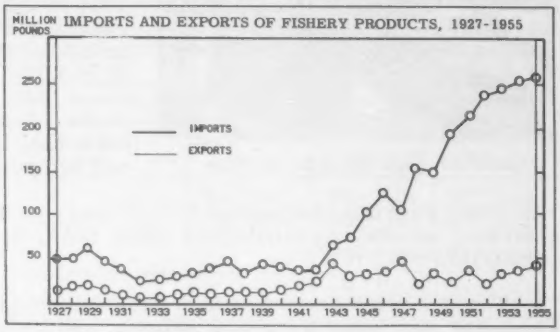
UNITED STATES FOREIGN TRADE, 1955: United States foreign trade in fishery products and byproducts during 1955 was valued at more than 296 million dollars, according to Imports and Exports of Fishery Products, 1951-1955 (C. F. S. No. 1360), recently issued by the Fish and Wildlife Service. This was an increase of 4 percent as compared with the previous year. Imports of $256 million were nearly 2 percent greater than those of the previous year, and exports of $40 million were 27 percent greater than in 1954.



During 1955 imports of edible fishery products amounted to nearly 770 million pounds valued at $207 million; nonedible products and byproducts imports were valued at $49 million. Among the more important items imported in greater quantity than in 1954 were fresh or frozen tuna; flounder fillets, swordfish, and other species; shrimp; canned salmon, tuna not in oil, crab meat, and common lobster; and pickled or salted cod.

Exports of edible fishery products in 1955 totaled 109 million pounds valued at $25 million; nonedible products and byproducts were valued at $15 million. Exports of canned fish and shellfish increased from 49 million pounds in 1954 to 89 million pounds in 1955 while the quantity of fish oils exported (143 million pounds) increased only 1 million pounds during the same period.

Washington

FISH AND SHELLFISH LANDINGS, 1955: Food fish and shellfish landed by Washington commercial fishermen in 1955 amounted to 147.6 million pounds, with a wholesale value of $33.5 million, according to a May 9, 1956, release by the State Department of Fisheries.

Nine states and Alaska outranked Washington in aggregate landings, but the value of the State's canned and processed fish was the third highest. Total pack was down slightly from 1954 because of the lower catch of sockeye salmon.

The quantity of the 1955 catch has been exceeded seven times since 1935, although the 1955 total is well above the 20-year average of 137 million pounds.

Salmon fishermen landed 8,381,400 fish worth $11,945,000 ex-vessel at an average of $1.43 per fish. The total salmon catch of 61.6 million pounds (22 percent of the U. S. and Alaska catch) was the smallest odd-year catch of salmon since 1943. The most prolific species of salmon, the odd-year pink, yielded 31,691,800

pounds, but the catch of chum salmon was the lowest since records have been maintained on the Puget Sound fishery.

The otter-trawl and long-line fleets landed 58.2 million pounds of sole, Pacific ocean perch, rockfish, and halibut; all with a processed value of $7.9 million. The catch exclusive of halibut totaled 42.1 million pounds. Only 1954 and 1945 were better trawl years.

Halibut and salmon fleet of the West Coast.

Shellfish production totaled 19.4 million pounds worth $6.0 million when processed. This included 10.1 million pounds of shelled Pacific and Olympia oysters, and 6.7 million pounds of Dungeness crabs. The crab catch (3,606,000 in number) was the second best since 1949. The 1954 crab catch was 4,182,700 crabs. Other shellfish production included hard-shell and razor clams, shrimp, scallops, and octopus--2.6 million pounds.

The remaining landings of 7.9 million pounds came from smaller fisheries on albacore, anchovies, candlefish, carp, hake, herring, shad, smelt, sturgeon, and industrial fish.

The statewide canned salmon pack amounted to 613,798 48-pound cases, of which 412,159 cases were pink salmon. While the total pack was not exceptional for an odd year, it was well above the average of 578,070 cases for pink salmon years since 1935. Puget Sound packers also processed 64,584 cases of salmon, mostly chum, from fish imported from Alaska and British Columbia.

For the first time figures are included on personal-use pack of salmon, razor clams, and other seafood. The 1955 pack was 6,527 48-pound cases. The 1954 pack was 4,427 cases.

The wholesale value of the entire salmon catch, excluding the pack from imported fish, was $21.5 million.

The State's production of all species of fish and shellfish comprised 3.2 percent of the poundage and 6.4 percent of the value of all fishery products landed in the United States and Alaska in 1955.

* * * * *

OLYMPIA OYSTER INDUSTRY ENDANGERED BY EXCESSIVE MORTALITY: The Olympia oyster which is native to the Puget Sound area of the State of Washington is threatened with extinction, according to industry spokesmen in that area. The oystermen predict that 90 percent of the Olympia oyster stocks will be wiped out within a year if mortalities continue at the present rate. The causes of the high rate of mortality is uncertain. Biologists of the Washington State Fisheries Department, who are investigating the problem, have not reached a final conclusion. However, fisheries biologists blame some of the losses on a parasitic flatworm which was introduced with the importation of Japanese or Pacific oyster seed.

Wholesale Prices, June 1956

Lower prices in June for fresh drawn haddock, fresh and frozen haddock fillets, frozen ocean perch and flounder fillets and fresh shrimp caused the June 1956 overall wholesale index (109.7 percent of the 1947-49 average) for all edible fish and shellfish (fresh, frozen, and canned) to drop 1.8 percent below that for May. However, this June's overall index was still 5.8 percent higher than in June 1955.

At Boston a labor-management dispute at a large fish cold-storage warehouse, which disrupted normal marketing of fish landings, and the usual seasonal increase in landings caused June 1956 ex-vessel fresh haddock prices to drop 20.6 percent below May and 35.7 percent below the same month a year earlier. The opening of the Pacific Coast halibut season and the increased supplies of fresh and frozen halibut induced a drop in prices from May to June of 13.3 percent for this product, but this June's prices were still 44.4 percent higher than in June 1955. Fresh-water

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1956 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			June 1956	May 1956	June 1956	May 1956	Apr. 1956	June 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.7	111.7	108.6	103.7
Fresh & Frozen Fishery Products:					117.5	120.6	115.2	107.4
Drawn, Dressed, or Whole Finfish:					106.3	113.3	100.5	101.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.06	.07	56.3	70.9	50.1	87.5
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.40	107.3	123.8	106.2	74.3
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.64	.63	144.4	140.5	137.1	129.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.53	.62	131.4	153.7	171.0	120.2
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.69	.74	139.5	148.6	121.3	136.5
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.58	.51	117.8	104.5	110.6	107.6
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.34	.29	78.6	68.0	49.3	103.8
Processed, Fresh (Fish & Shellfish):					127.7	126.1	126.6	111.6
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.25	.27	85.1	91.9	81.7	107.2
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.82	.79	129.3	124.8	124.3	111.4
Oysters, shucked, standards	Norfolk	gal.	5.50	5.50	136.1	136.1	139.2	114.4
Processed, Frozen (Fish & Shellfish):					112.1	115.2	114.3	103.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.40	102.1	103.4	103.4	102.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.28	.29	86.3	91.0	91.0	81.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	110.8	114.8	114.8	106.7
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.75	.76	116.1	118.1	116.5	103.4
Canned Fishery Products:					98.7	99.0	99.2	98.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	21.27	21.27	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	case	10.60	10.60	76.4	76.4	77.1	90.1
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	case	7.50	7.50	87.5	87.5	86.1	88.1
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	case	8.20	8.45	87.3	89.9	89.9	71.3

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

fish price trends at Chicago and New York were mixed, with whitefish prices lower because of adequate supplies and yellow pike and lake trout prices higher because of light supplies. All of these factors caused the June 1956 index for the drawn, dressed, or whole finfish subgroup to drop 6.2 percent below May, but it was 4.9 percent higher than in the same month in 1955.

From May to June higher prices for fresh shrimp at New York City more than offset lower prices for fresh haddock fillets at Boston and the fresh processed fish and shellfish subgroup index rose 1.3 percent in that period. Compared with the same month in 1955, the June 1956 index for this subgroup was 14.4 percent higher because substantially lower prices for fresh haddock fillets were more than offset by considerably higher prices for fresh shrimp and shucked oysters.

Fish auction at Boat Fish Exchange.

All items appearing under the frozen processed fish and shellfish subgroup were priced lower this June than the previous month, and the index for this subgroup dropped 2.7 percent during that period. The index for this subgroup was 8.6 percent higher this June than in the same month a year earlier because frozen haddock fillets, ocean perch fillets, and shrimp were priced considerably higher.

There was very little price movement in the canned fishery products subgroup items with prices this June only slightly lower than the previous month and only slightly higher than in June 1955. With the appearance of the new pack of Maine sardines on the market, prices for this product dropped slightly from May to June in spite of the fact that the pack through June was not very substantial. Compared with June 1955, prices this June were considerably higher for canned Maine sardines and pink salmon because supplies were rather limited, but canned tuna prices were 15.2 percent lower because there were more than ample supplies.

IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1951-1955

This annual bulletin (Imports and Exports of Fishery Products, 1951-55, C. F. S. No. 1360) shows United States fishery import and export data for the years 1951 through 1955. The quantity and value of the fishery products and byproducts imported and exported by type of product are shown.

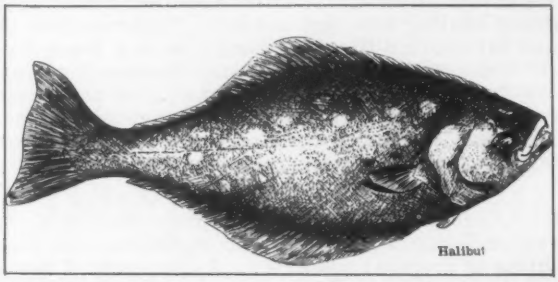
Copies of this publication are available free from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

FOREIGN

International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

FIRST SEASON IN AREAS 2 AND 1B CLOSED: The International Pacific Halibut Commission announced the closure of the first season in Areas 2 and 1B to halibut fishing at 6 a.m. (P.S.T.), June 27, 1956, until the beginning of the second fishing season in these areas. The Commission estimated that the 26.5-million-pound limit set for Area 2 would have been caught by that date. Area 1B which had no catch limit was also closed when the quota for Area 2 was attained.


Halibut

The official opening date for all halibut fishing in the Pacific regulatory areas this year was May 12 at 6:00 a.m. (P.S.T.). However, this year both United States and Canadian fishermen voluntarily agreed not to start fishing until May 20. In 1955 the official opening date was also May 12 (actual fishing also started on that date), and Areas 2 and 1B in that year closed on June 5. Halibut fishing Areas 2 and 1B this year were open for 46 days, but because of the voluntary agreement to start fishing on May 20, fishing took place for only 38 days. These same areas were fished for 24 days in 1955, 21 days in 1954, and 24 days in 1953. The fishing in these areas lasted longer this year because (1) fishing started 8 days later than the opening date, (2) most vessels voluntarily agreed to remain idle for 7 days after each trip, (3) there was about three days of inclement weather on the fishing grounds, and (4) fish were scarce in certain popular fishing sections.

The second fishing season in Areas 2 and 1B shall commence at 6 a.m. (P.S.T.) on August 10 for at least seven days with no catch limit, or on a later date that may be announced by the Commission prior to commencement of the second season, or if the termination of the first season in Area 2 or in Area 3A be later than 6:00 a.m. on July 25, the second season in Area 2 shall commence at 6:00 a.m. 16 days after termination of the first season in Area 2 or in Area 3A, whichever shall be later, and shall terminate at 6:00 a.m., seven days after commencement of the second fishing season in Area 2, or on any later day that may be announced by the Commission prior to the commencement of the second season.

Area 2 includes all Convention waters off the coasts of the United States and Alaska and Canada between Willapa Bay and Cape Spencer, Alaska.

Area 1B includes all Convention waters between Heceta Head and Willapa Bay, Wash.

Areas 3A and 3B on June 27 were still open to halibut fishing and will close when the limit for Area 3A of 28 million pounds has been attained.

FOOD AND AGRICULTURE ORGANIZATION

ANTIBIOTICS USE AND QUALITY ASSESSMENT HIGHLIGHTS FISH-PROCESSING TECHNOLOGISTS MEETING: The use of antibiotics as an aid to keeping fish in a fresh condition and the problems associated with the assessment of the quality of fish were the highlights of the International Meeting of Fish Processing Technologists which was held at Rotterdam, The Netherlands, June 25-29, 1956.

The meeting, which was organized by the Food and Agriculture Organization of the United Nations, was attended by more than 100 fishery technologists from about 30 countries. The reports from working groups set up by the FAO Interim Committee on Fish Handling and Processing were first heard and then followed a symposium on the chilling of fish.

The first report of the working groups of the FAO Interim Committee on Fish Handling and Processing was on chilled fish, presented by F. Bramsnaes, Director, Technical Laboratory, Danish Ministry of Fisheries, as Chairman of the working group dealing with that subject. In the course of his report, Bramsnaes said that it was far more difficult to keep fish in a fresh condition than to keep other food in a similar condition. Most foodstuffs kept in a good condition at any one of a range of low temperatures, but fish was a more sensitive product. He gave as an example the fact that cod will keep fresh twice as long at 0°C. (32° F.) as at 4° C. (39° F.). This fact, which has been shown in the later years by the scientists, was of practical importance to the fishing industry.

The second report, that of the working group concerned with fishery products for tropical consumption, was presented by K. Bakken, Norwegian Fisheries Research Institute, Bergen, who stated that the working group had surveyed the food habits in tropical countries. As a result of this survey the group had come to the conclusion that there was a potential market in many tropical countries for unsalted, dried, or smoked and dried whole herring and other fish, as well as for dried minced fish and for fish meal. This report indicated that the fishing industry in Europe and North America might find a considerable market for certain products in countries in Africa and Asia where there was an acute need for providing more animal protein in the diet of the masses of the people.

E. Heen, Director, Norwegian Fisheries Research Institute, Fisheries Department, Bergen, as Chairman, presented the report of the working group concerned with the freezing of fish in bulk.

These reports stimulated considerable discussion among the delegates before the meeting turned to the symposium on the chilling of fish, in the course of which some 27 papers were presented.

The first session of the symposium was concerned with 9 papers dealing with the use of antibiotics, bacteriostatic ices and dips, and it was clear from the discussion which followed that the subject of antibiotics was in the forefront of the minds of most participants. Most of the 9 papers were concerned with experiments which have been made with such antibiotics as aureomycin and it can be generally said that these experiments show that the use of antibiotics may help considerably in keeping fish in a fresh condition, in some cases as much as 2 or 3 times as long as is now possible by using such conventional methods as storing in ice. Various uses of antibiotics were described in the papers, some of them concerned with impregnating ice with aureomycin or other antibiotics.

It was clear from the papers presented and from the discussion that one of the problems confronting fishery scientists was to devise a method which would insure that the residue of any antibiotics left in fish would be so minute as to be innocuous to human beings. Scientists are also concerned with insuring that antibiotics used are distributed evenly throughout the ice.

It was pointed out at the meeting that the Governments and public health authorities would need to have very carefully detailed facts concerning the residue and its harmlessness to human beings before they would be justified in officially sanctioning the use of antibiotics to preserve fish. So far, no government has approved the use of antibiotics for this purpose.

Some experts at the meeting urged that this problem of residual antibiotics should be approached with "common sense" and that excessive apprehension as to any possible injurious effect of residual antibiotics should not stand in the way of progress in this field. Indeed, many experts at the meeting were emphatic that the time had come to conduct large-scale experiments by responsible institutes in the use of, for example, aureomycin-treated ice on trawlers engaged in long-distance fishing. This could be done, they urged, with the consent of the public health authorities in the countries concerned, and the results would, they suggested, provide a very clear guide as to future action.

While the points concerned with the public health factor were given due consideration by the experts at the meeting, it was evident that most of the technologists felt that the use of such antibiotics as aureomycin might be extended to commercial fishing in the near future. Some experts, indeed, feel that antibiotics should be introduced without delay.

Dr. H. L. A. Tarr, of the Fisheries Research Board of Canada, who was a pioneer in the use of antibiotics to preserve fish, has expressed an opinion that the residual antibiotics would not be dangerous to human health.

Two reports by United States scientists showed that, in one experiment, fish fillets treated with 10 p.p.m. of chloramphenicol, oxytetracycline, tetracycline, and chlortetracycline spoiled after 8, 11, 10, and 13 days respectively, as compared with 4 days for untreated fillets.

In another experiment, haddock fillets dipped for 30 seconds in antibiotic-treated brine kept in good condition for 7 days and more.

Dr. J. M. Shewan, of the Torry Research Station, Aberdeen, reporting on experiments with aureomycin, stated that such fish as haddock and cod had been kept in an edible condition for 7 to 10 days longer than possible by conventional methods. These results had been confirmed by pilot-scale trials on board a trawler.

Japanese scientists, T. Tomiyama, Y. Yone and S. Kuroki, of Kyushu University, also recorded similar successful results in experiments with aureomycin used in storing yellow croaker, red sea bream, and red-tongue sole.

A paper on "Aureomycin as an Ice Additive" by B. Albertsen, of the Technological Laboratory, Danish Ministry of Fisheries, stated that tests indicated cod could be kept in good condition 5 to 6 days longer in aureomycin-treated ice. Similar results were reported by Sverre Hjorth-Hansen of the Norwegian Fisheries Research Institute, Bergen.

Dealing with the "Public Health Aspects of the Use of Antibiotics in Foods," C. Engel, of the Central Institute for Nutrition Research, Utrecht, said that "sensitization of future patients" and the induction of resistance in strains of bacteria are important problems which must be carefully considered before permission is granted to use antibiotics for keeping food in a fresh condition. If the residual level of the antibiotic in fish or other fresh food is negligible some, but not all, of the objections to its use will be eliminated. The best answer would be to use antibiotics which are not applied in medical practice and do not give rise to bacterial cross-resistance to antibiotics used in the human body.

C. H. Castell, of the Fisheries Research Board of Canada, said that the first requirement for landing fish in a fresher condition was more hygienic handling of

the catch on board fishing vessels. When this was achieved, then the antibiotics might be used with advantage to preserve fish. Antibiotics should not be used to overcome bad, unhygienic handling of fish.

Other experts at the meeting pointed out that manufacturers of antibiotics were aware of this and were in agreement with the view expressed by Castell.

Five papers were presented on brine cooling and seawater ice, and considerable discussion took place concerning them. But, next to the papers concerned with antibiotics, the 12 papers dealing with quality assessment of fresh fish provoked the most discussion. Here the meeting considered both organoleptic and objective methods of quality assessment, and it was evident from the discussion that the technologists thought that much more use should be made of the panel system for testing quality of fish. It was clear that no method or system had yet been devised which was applicable generally but it was felt that progress had been made in this field. The aim was to devise an objective method of testing the quality of fish which could be applied on a commercial basis, but much experimental work remained to be done.

There is no doubt that the meeting had several practical results. Perhaps the most important for the fishing industry throughout the world was the clear expression of opinion of the experts that the time had come to carry experiments in the use of antibiotics from the laboratory to the commercial field. The experts felt that these experiments should be conducted, with the concurrence of governments and public health authorities, on a large scale with fishing vessels, particularly those engaged in long-distance fishing. This, it was felt, would establish the effectiveness of antibiotics in preserving the fresh condition of fish and would also enable authorities to determine the element of risk entailed in residual antibiotics in fish.

The meeting also showed that a great deal of work is now being done in the assessment of the quality of fish and that ultimately this may lead to the establishment of quality assessment of all catches landed by the leading fishing countries.

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PLAN FOR CUTTING COSTS IN BUILDING FISHING BOATS: Costs of building fishing boats may be cut by as much as 10 percent if a plan for establishing a universal system of standards for scantlings, now being prepared by naval architects of the Food and Agriculture Organization (FAO), Rome, is finally adopted. The system would also lead to developments in the design of fishing vessels and an increase in their seaworthiness and operational efficiency.

Speaking at FAO headquarters this week, Jan Olof Traung, Chief, Fishing Boat Section, Fisheries Division, said: "Work on preparing a first draft of a universal system of standards of scantlings is still in the formative stage, although we have for some years past been gathering information on the design and construction of fishing boats, paying special attention to the smaller vessels, those under 100-foot over-all length.

"We have acquired first-hand knowledge of construction problems and local requirements in Europe, North America, and also in the Near, Middle, and Far East and South America, where FAO naval architects have been engaged on various projects.

"At the present moment we are especially well placed to plan the future work on reducing boat construction costs," he continued, "as we have four FAO naval architects at headquarters: Paul Ziener of Norway, who has been working for us in India for the past two years, Howard Chapell, an American naval architect who is known throughout the world for his work on fishing boats (he is going on an FAO assignment in Turkey), my assistant, Peter Gurtner from Switzerland, and myself."

These four experts have been reviewing the progress made in fishing-boat construction, based on the reports, plans, and designs of naval architects throughout the world.

"Recently," said Traung, "Dwight Simpson, a well-known American naval architect, in an unpublished study dealing with wooden-trawler construction, made some far-reaching recommendations for minimum standards of scantlings.

"Simpson based his findings on the case history of more than 20 vessels. By comparison, European vessels were found to be suprisingly heavily constructed. This is also true, as we know from experience, of fishing boats in many other parts of the world and we believe that if the Simpson recommendations were universally adopted the result would be to cut the present high costs of fishing-boat construction, especially in Europe and in many of the underdeveloped countries."

The system envisaged by the FAO naval architects would call for no departure from normal construction methods carried out by skilled craftsmen.

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INTERNATIONAL FISHING GEAR CONGRESS PLANNED: An International Fishing Gear Congress is being planned by the Food and Agriculture Organization (FAO), Rome, to take place in October 1957 in Hamburg, Germany.

The Congress will bring together from many parts of the world specialists working in the field of fish gear research, design, and manufacture to discuss such subjects as net yarns, net-making, rational design of fishing gear, including fish detection and the use of electrical equipment.

"This will be the first time that such specialists from various parts of the world will meet to exchange knowledge, experience, and ideas," explained the Chief of the Fishing Gear Section of the Fisheries Division of FAO. "The Congress will last a week and will concentrate on recent developments in fishing-gear design, materials, and construction, including such matters as the measurement of the performance of gear, detection of fish, behavior of gear under water, reaction of fish to it, and so on.

"There has been a vast increase in capital investment in fishing equipment in recent years," he continued, "and fishing-gear technology is assuming an ever-growing economic importance. One objective of the Congress will be to focus attention on this, taking stock of existing knowledge in this field."

In connection with the Congress, FAO is compiling a comprehensive Handbook of Fishing Gear and Methods, the first of its kind. The book will provide detailed descriptions and specifications of advanced types of fishing gear, equipment and methods, and will give solid background information to the many topics which will be discussed at the Congress.

The purpose of this Congress is to emphasise the recent developments in fishing gear, not to describe traditional types of gear which have long been used in fishing in various countries. The Congress therefore is concerned with the latest types of commercially-important gear and with current thought and experiment concerned with improving existing fishing gear and accessory equipment, manufacturing it more economically, making it more efficient, and operating it more effectively. In view of these considerations, the proposed agenda for the Congress has been drawn up under these main headings: (1) materials; (2) rational design of fishing gear; (3) rational construction of nets; (4) operation of fishing gear; (5) strategy and tactics of fishing; (6) electrical fishing; (7) future developments.

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UNITED STATES NOMINEE FOR DIRECTOR-GENERAL OF FAO: The Departments of State and Agriculture announced jointly July 12 that John H. Davis, director of the Program in Agriculture and Business at Harvard University Graduate School of Business Administration, will be the United States Nominee for Director-General of the Food and Agriculture Organization.

A special conference of FAO is being held in Rome in September to select a successor to Dr. P.V. Cardon, who was elected Director-General in 1953 and resigned last March because of ill health.

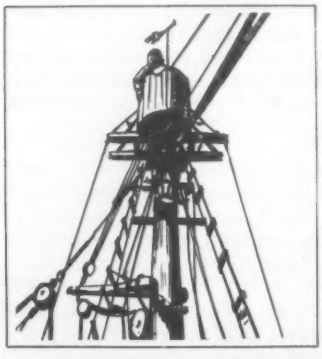
Davis is a former Assistant Secretary of Agriculture and former president of the Commodity Credit Corporation.

The decision to nominate Davis for the Director-Generalship has been made after consultation with, and the approval of, Congressional and farm organization leaders. Member nations of FAO have been consulted regarding Davis and a number of them have informally indicated their support.

Under FAO procedure, the United States delegation to the special conference will formally submit the name of Davis as candidate for the Director-Generalship. The member countries of FAO will elect the new FAO head by majority vote.

WHALING

NUMBER OF WHALE CATCHER BOATS REDUCED BY AGREEMENT: According to an agreement arrived at in June 1956 between Norwegian, British, Dutch, and Japanese whaling companies, the number of catching boats engaging in Antarctic whaling will be reduced from last season's 257 to 225 in the 1956/57 season.



Under the agreement the nine Norwegian expeditions will reduce their catchers from 110 to 95, the four British expeditions from 59 to 47, and the Dutch from 18 to 14. The five Japanese expeditions, including the newly purchased Onassis expedition, will have 54 catchers, compared to 55 for the same expeditions last season.

The agreement also specifies that no one expedition will use more than 12 catcher boats. The Soviet Union has not yet indicated whether it will also reduce its total of catchers.

The agreement is the result of efforts on the part of Norwegian whaling companies to limit the number of catchers per expedition as a conservation measure, states a June dispatch from the United States Embassy in Oslo.

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SOUTH PACIFIC SPERM WHALE ALLOTMENT PROPOSED: An advertisement in the Lima newspaper El Comercio of June 10, 1956, signed by the Secretary General of the "Permanent Commission of the South Pacific," it stated that the Commission of the Conference of Exploitation and the Conservation of the Maritime Resources of the South Pacific was scheduled to meet on June 25 in Lima. The meeting was to deal with allocating to interested parties their share of the allotment of 2,100 sperm whales which has been set for the period July 1, 1956, to June 30, 1957. Such parties were advised to send their applications through their Consuls or representatives to the Secretary General of the Permanent Commission in care of the Ministry of Foreign Relations, Quito, Ecuador, before June 23, according to the United States Embassy at Lima (June 20, 1956).

An article in La Prensa of June 19 on this subject stated that any attempt to hunt whales within 200 miles of the coasts of Chile, Ecuador, and Peru would be considered an act against the sovereignty of those nations unless permission had first been obtained from The Permanent Commission.

Australia

FISHERIES DEVELOPMENT FUND PLANNED: Legislation is in the process of passing through the Australian Parliament setting up under the Fishing Industry Bill of 1956 a Fisheries Development Trust Account. The trust fund would be used as a revolving fund for the development of new projects which could be liquidated as soon as private investors were willing to take them up. The fund is to be administered by Australia's first Minister for Primary Industry. Marked for first attention in planning a developmental program for consideration by the Minister are shrimp, pilchards, tuna (Queensland, North-West Australia and outer South-Eastern Australian waters), and trawling in the Great Australian Bight.

The fund will be financed from the surplus which will arise from the sale of the Australian Whaling Commission's business (a Government operation) at Carnarvon in Western Australia for about US$2.0 million. It is reported that the sale will make possible the biggest move in Australia's history for the development of the nation's fishery resources, for the surplus from it, which may amount to US$1.7 million, will be paid into a new Fisheries Development Trust Account for that purpose, a June 6 United States Embassy dispatch from Canberra points out.

In his Second Reading Speech on the Fishing Industry Bill, the Minister for Trade explained, "The surplus funds received from the sale of the Australian Whaling Commission will be used for the purpose of developing fishing industries which have great potentialities, but which would not attract--at any rate up to now have not attracted--investment funds without Government support or demonstration." He indicated that with large-scale investment and new techniques on fishing there was hope that the catch of tuna, prawn, shrimp, and perhaps other fish (e.g. pilchards, barracouta, and Australian "salmon") could be improved. Were the Government to show the way, it might be possible that private interests would come in to enlarge the present investment--"about US$22.5 million in fishing and pearling fleets, shore installations and factories and a further US$7.9 million in the whaling industry"--in the Australian fishing industry, the Minister indicated.

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STATE CABINET MINISTER TO VISIT U. S. FISHING PORTS: The Honorable Lionel Francis Kelly, West Australian State Cabinet Minister for Mines, Fisheries, Industrial Development and Tourism, was planning a three months' visit to the United States and Canada starting in late July 1956. He will be accompanied by two of his staff.

In addition to providing information on Western Australia to interested persons and groups throughout the United States, the Minister was specifically interested in certain industries related to his cabinet responsibilities, including fisheries, the United States Consulate at Perth points out in a June 12 report.

Commercial development of West Australian fisheries, with the exception of spiny lobster for export to the United States, has lagged. The Minister was interested in studying catching and handling methods for tuna, herring, shrimp, and lobster, and particularly wished to contact any groups which might consider investment in fisheries projects in Western Australia.

With reference to spiny lobster (crayfish), the Minister wished to meet importers and distributors and to study marketing techniques, with special reference to trade promotion by South Africa and other competing countries to determine whether Australia is losing potential markets or failing to get best prices.

Canada

MANDATORY STANDARDS FOR FISH STICKS: Canadian producers of cooked and uncooked fish sticks must comply with certain mandatory standards put into effect June 7, 1956 in an amendment to the Fish Inspection Regulations. Any fish sticks imported into Canada must also conform to these mandatory standards.

The text of the amendment is as follows:

"His Excellency the Governor General in Council, on the recommendation of the Minister of Fisheries, pursuant to section 4 of the Fish Inspection Act, is pleased, hereby, to amend the Fish Inspection Regulations made by Order in Council P. C. 1954-1973 of 16th December 1954, as amended, as follows:

"1. (1) Section 2 of the Fish Inspection Regulations is amended by adding thereto, immediately after paragraph (a) the following paragraph:

"(aa) 'breaded fish' means fish flesh coated with breading or batter and breading but does not include fish sticks.

"(2) Section 2 of the said Regulations is further amended by adding thereto, immediately after paragraph (b) thereof, the following paragraph:

"(bb) 'fish sticks' means uniform, rectangular shaped portions of fish flesh which are coated with breading or batter and breading.

"2. The said Regulations are further amended by adding thereto the following section:

"60. No person shall pack or sell fish sticks which do not meet the following requirements:

"(a) fish sticks shall weigh not less than 1 ounce each; (b) cooked fish sticks shall include a minimum of 66⅔ % by weight of fish flesh; (c) uncooked fish sticks shall include a minimum of 75% by weight of fish flesh; and (d) fish sticks shall be free from defects and shall be of good merchantable quality."

It should be noted that these are mandatory standards as compared to the voluntary United States standards for grades of frozen fried fish sticks developed by the U. S. Fish and Wildlife Service in cooperation with interested industry representatives. Any fish sticks exported to Canada must conform to the Canadian mandatory standards for cooked and uncooked fish sticks.

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LARGE NEW RESEARCH VESSEL: A larger and more extensively-equipped research vessel than any in its present fleet of about 14 is to be built for service in the Northwest Atlantic by the Fisheries Research Board of Canada. Tenders are being called for a 167-foot Diesel-powered steel-hulled trawler with a 32-foot beam, a draught of 12 feet 9 inches, and a refrigerated fish hold. This is part of the Board's expanded program, made necessary in part by Canada's increasing commitments in international fisheries affairs, according to the June 8 Bulletin of the Fisheries Council of Canada.

The new vessel will carry a crew of about 22 and will have accommodations for 4 or 5 scientists who will work in specially-designed laboratories to be incorporated in the vessel's working quarters. The craft is designed for exploratory and investigational work and will be capable of extended trips, often in areas remote from present fishing ports, to study the population densities of various species of fish. She will operate mainly out of St. John's Newfoundland, but is designed to serve other Board stations situated on the mainland as well.

In addition to the laboratories for biological and hydrographical work, the new research ship will carry all the latest detection devices. The fishing gear will be calibrated so that the catches will be compared with the catches of a regular trawler. She will have adequate power to fish at depths greater than those fished normally. A controllable-pitch propellor will enable her to cruise at speeds from zero to a maximum of about 12 knots.

Denmark

TWO NEW FISH MEAL PLANTS IN OPERATION: Two new fish meal and fish oil plants have begun operations at Ronland, on the northwestern coast of Jutland in Denmark. One plant is a corporation and the other is a cooperative. Present capacity of both plants is about 150 tons of raw fish daily, but the corporation plant has already announced plans to extend its daily capacity to nearly 300 tons of raw fish.

It is also reported that landings of "tobis" (a type of small sand eel) on the west coast of Jutland have been unusually heavy in the current season and that fish meal plants in the area have been forced to set an informal limit upon the total amount of "tobis" which will be accepted from each vessel, states a report (June 21) from the United States Embassy at Copenhagen.

German Federal Republic

TRAWLER OWNERS TO CONTINUE SUPPORT OF EXPORTS OF FROZEN FISH: An overwhelming majority of the owners of large German trawlers based at Bremerhaven have decided to continue the supporting of exports of quick frozen ocean fish which exporters have purchased from the trawler owners and have had processed in Bremerhaven.

Exports to the United States and to Austria, especially, will be supported according to Dansk Fiskeritidende (June 8), a Danish fishery trade paper.

This support will, at the same time, promote the rational storage of quick-frozen ocean fish at times when there are large supplies at the four main German

fish markets. Often it is difficult to dispose of all supplies, especially early in the year when 60 percent of the large trawlers trawl for herring in the westerly North Sea. In addition, it will provide for making full use of the Bremerhaven freezing capacity.

Iceland

FISH FREEZING PLANTS: There are 82 freezing plants in Iceland that are available for fish freezing and storage, according to the April 1 issue of Aegir, an Icelandic fishery publication. Two of the plants are reported to have been inactive for some time. In addition to the land-based plants, four of the larger trawlers are equipped with freezers, each with a freezing capacity of two metric tons of fillets in 16 hours.

The 32 plants are located in six districts and vary from 7 to 24 plants in each district. Under the most favorable conditions the land-based plants can freeze 1,102 metric tons each 16 hours and store 38,270 tons. The annual capacities for both freezing and storage will vary according to the length of the season, the availability of labor, and transportation facilities. The capacity of the plants for the storage of fish for human consumption is limited by the need for space for about 8,000 tons of fish bait and the seasonal storage of 6,000 tons of meat products (Fiskets Gang, May 3, 1956).

Japan

JAPANESE-MEXICAN FISHING COMPANY PLANNED: A joint Japanese-Mexican fishing company known as the Japan-Mexico Enterprises, Ltd. (Nichi-boku Kigyo Kabushiki Kaisha) has been formed, according to the May 15, 1956, issue of Hokkaido Shimbun, a Japanese newspaper. Plans reportedly call for 70 Japanese drag-net fishermen to go to Mexico initially, with a possible increase in numbers up to 3,600 in the future.

The organizer of the new company is the Hakodate (Hokkaido) Drag-Net Fishery Cooperative Association. This cooperative has formed, in association with Mexican fishing interests and with the blessing of the Mexican government, a Japanese-Mexican joint fishery company in Mexico. It is stated that the Mexican government has granted permission for the entry into Mexico of 6 Japanese trawlers and 36 skilled Japanese fishermen for a period of six months. Application has been made to the Fisheries Division of the Hokkaido Perfectural Government for certificates of qualification for the 36 fishermen. A representative of the Fisheries Division confirmed this last item, but stated that he could not confirm the rest of the report. His office is awaiting more details before deciding what attitude it will take toward the request for certificates.

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PRODUCERS FORM NEW FROZEN TUNA SALES AGENCY: Currently, albacore is exported by private exporters but transactions are controlled by an association of Japanese exporters which maintains a list of approved importers. This organization, Japan Frozen Food Exporters Association, also determines and controls the voluntary limits which have been placed on albacore exports to the United States.

Another organization, known as the Japan Export Frozen Tuna Sales Co., Ltd., was scheduled to begin functioning on June 15, 1956. This organization will act as sole purchaser from fishing companies of Japanese frozen albacore destined for export and will in turn sell to exporters. The purpose of the new organization, which will be controlled by fishing firms, is to protect the interests of producers and, in so doing, to control the amount of albacore that is exported. An important consideration in this connection is the producers' interest in fixing prices in accordance with market conditions.

The new organization in its initial stages will control only albacore, but it will also handle other species of tuna in the future. The limitations on albacore export sales to the United States for the Japanese fiscal year 1956 (which began on April 1, 1956) has been fixed at 32,000 short tons, of which 20,000 short tons are to be sold in the period April-September and 12,000 for the October-March period, according to a dispatch from the United States Embassy in Tokyo

Mexico

FISHING-PERMIT FEES INCREASED: Mexico has increased its fees for commercial and sport fishing permits issued to nonresident aliens and vessels of foreign registry.

The fees were raised in accordance with two decrees published in the Diario Oficial of May 15 and effective the following day.

Under one decree nonresident aliens who fish for sport in any Mexican territorial water must pay for a general fishing permit valid for 1 month, 3 months, or 1 year from date of issue, a fee of 10, 25, or 50 pesos (about US$0.80, $2, $4), respectively. Previously applicable fees, established by a decree of January 20, 1933, were 4, 10, or 20 pesos (about US$0.32, $0.80, $1.60).

The other decree, modifying fees for commercial and sports fishing, established by a decree of November 17, 1939, provides that persons desiring to fish commercially in Mexican territorial waters of the Pacific Ocean and Gulf of California in vessels of foreign registry and sending their catch to foreign markets will pay annual fees in accordance with the type of permit obtained. The new fees, together with old fees, are as follows:

General fishing permit for vessels having a net cubic capacity of:

	New Fees		Old Fees	
	Pesos	US$	Pesos	US$
Up to 2 tons	130	10.40	50	4.00
2-15 "	260	20.80	100	8.00
15-50 "	520	41.60	200	16.00
50-100 "	775	62.00	300	24.00
100-200 "	1,035	82.80	400	32.00
Over 200 "	1,290	103.20	500	40.00

Use of foreign-registered vessels having a net cubic capacity of:

	New Fees		Old Fees	
	Pesos	US$	Pesos	US$
Up to 2 tons	130	10.40	50	4.00
2-15 "	520	41.60	200	16.00
15-50 "	1,200	96.00	500	40.00
50-100 "	2,580	206.40	1,000	80.00
Over 100 "	5,160	412.80	2,000	160.00

If two or more boats are to be used, the tonnage is taken together and the fees established for the vessels, as shown above, are charged on the basis of total tonnage. If after obtaining a general fishing permit or authorization for use of a foreign-registered vessel an amplification of a permit or authorization is requested because the tonnage has been increased to

exceed the tonnage shown in the category to which the permit applies, the difference in fees for the lower and higher categories must be paid for the length of time still remaining in the original permit.

Item	New Fees		Old Fees	
	Pesos	US$	Pesos	US$
COMMERCIAL FISHING:				
Registry of foreign vessels:				
For each ton or fraction thereof of net cubic capacity	15	1.20	5.70	0.46
Registry of nets:				
For each linear meter or fraction thereof, measured on cork line	0.55	0.044	0.21	0.017
Issuance of identification cards:				
To nonresident aliens	12	0.96	4	0.32
To nationals or resident aliens	1	0.08	1	0.08

Item	New Fees		Old Fees	
	Pesos	US$	Pesos	US$
SPORT FISHING (for nonresident aliens):				
Fishing for sport on board a foreign vessel (per day)....	12	0.96	2.50	0.20
Fishing for sport on board a privately-owned vessel or a vessel of Mexican registry:				
For 3 days	6	0.48	2	0.16
For 1 month	12	0.96	4	0.32
For 3 months	25	2.00	10	0.80
For 1 year	50	4.00	20	1.60

The year will be counted from date of issue of a general permit, authorization for use of foreign vessel, or registration of vessel and nets. Identification cards are valid only during the year of issue.

Individuals and organizations owning foreign vessels engaged in sport fishing in Mexican territorial waters of the Pacific Ocean and Gulf of California will pay an annual fee of 2,070 pesos (US$165.60). Formerly the fee for this type of permit was 800 pesos (US$64.00).

Nonresident aliens engaged in sport fishing in Mexican territorial waters of the Pacific Ocean and Gulf of California will pay fees for individual permits in accordance with registry of vessel.

Norway

DRIED AND SALTED FISH EXPORT PROSPECTS REVISED: The predictions made by Norwegian exporters early in the spring of 1956 of good export prospects for fishery products have not materialized, according to a June dispatch from the United States Embassy in Oslo.

In spite of the fact that exports of salt cod and dried fish were larger from January-April 1956 than for the comparable period in 1955, increased production and difficulties in expanding the market have caused large stocks of unsold fish to accumulate. Frozen fish fillet plants have 10,000 metric tons on hand with little prospect of early sales. The outlook for increased exports of dried fish is so poor that some producers have suggested selling it to fish meal plants, if no financial support is provided by the Price Regulation Fund for Fish.

The klipfish is carefully stacked between spells of exposure to the sun.

There are still 3,000 to 4,000 tons of unsold dried fish on hand from 1955. Klipfish or salt cod is in a somewhat more favorable position, with exports of 22,000 tons by June 1 compared to 18,000 tons in the comparable 1955 period, but the outlook in several markets, notably Brazil, is uncertain.

A quota system for klipfish exports has been hotly debated since the latter part of 1955, but no decision has been reached as yet. Unless market conditions improve or the Government permits acceptance of lower export prices, industry circles anticipate unsold stocks of 30,000 to 40,000 tons of fish by the end of the year. It is believed that the fish exporters tend to exaggerate the gravity of the export situation, but the high prices of Norwegian fishery products are undoubtedly affecting the sales in foreign markets.

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COD CATCH HEAVY THIS YEAR: Owing to the favorable results of fishing off Finnmark and partly good fishing in other districts, this year's cod fishing season has yielded a rather heavy catch. This season's catch as of June 16 totaled 159,671 metric tons of cod as against 123,286 tons last year. The cod catch was utilized as follows this year: 77,961 tons sold for drying (last year 63,038 tons), 60,776 tons for curing (last year 40,017 tons), and 20,934 tons for the fresh fish trade (last year 20,231 tons). In addition, there was a production of 6,614 tons of cod-liver oil; 3,050 tons of roe were cured and 1,132 tons of roe were canned or sold fresh, reports the June 21 Fiskets Gang, a Norwegian fishery periodical.

Sorting the catch--Lofoten cod fishing.

A new postwar record of 53,562 metric tons of spring cod were caught off Finnmark this season--almost one-third this season's total cod catch of 159,671 tons. Last year the catch off Finnmark amounted to 46,767 tons.

The Finnmark spring cod fishery is becoming increasingly important. For the last two years, the total Finnmark catch, including other types of fish such as saithe, ocean perch, haddock, and halibut has exceeded the Lofoten cod catch. The number of freezing plants in Finnmark is still insufficient to process a larger catch, but freezing capacity is being expanded rapidly. If present marketing difficulties are overcome, the outlook for further growth of the Finnmark fishery is good, points out a United States Embassy dispatch (June 29) from Oslo.

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AUTOMATIC HERRING FEEDING AND SORTING MACHINE: An article titled "Sorting Machine for Herring" which appeared in the Norwegian Fisheries Directorate's publication Fiskets Gang, No. 23, June 7, 1956, is a research report on the successful trials of a machine which both aligns the herring for feeding and feeds them into the heading and gutting part of the machine. Experiments conducted by the Directorate's Chemical-Technical Research Institute have proved successful, and a prototype is now being tested commercially in the Icelandic fishery, points out a United States Embassy dispatch (June 26) from Oslo.

If the machine is commercially feasible, it will be a great help to the herring industry. It can possibly be used in processing other types of fish as well with certain modifications. The machine takes little space, is relatively inexpensive, and results in a significant saving in labor. It is also apparently suitable for use on board fishing vessels which operate in waters distant from their home ports and consequently process their catches on board.

The principal portion of a translation of the article follows:

"In the following we shall give an orientation concerning a new machine for aligning and feeding herring to other herring processing machines. There has been some incorrect information on this machine in the press. Otherwise it may be of interest to hear something of the problems of which this machine is only a part and on which we in the Fishery Directorate Chemical-Technical Research Institute have been working and will continue to work to the extent we get the necessary funds.

"It is common knowledge that little has been done so far to rationalize and improve the salted herring production. Most of the salting is still manual. The lack of mechanization is largely due to the fact that production takes a relatively short time, so that the costs of mechanization become too high in relation to the quantity produced.

"Ordinary salted herring (pickled herring) is one of the important products where a certain degree of mechanization at the larger salting works would pay, and we have made some experiments in this field. For example, we tried drum salting some years ago. Salt and herring were fed into one end of a revolving drum. The mixing in the drum was most effective and the product evenly salted. However, the best utilization of drum salting requires that the herring and salt be fed automatically into the drum in specific adjustable quantities direct from a large reservoir. We completed plans for this method long ago but have been unable to put it into effect, chiefly because of shortage of funds.

"In the case of salting in barrels the outlet end of the drum is automatically conducted from each barrel, as it is filled, to the next empty one. It is obvious that some of the labor costs of manual salting could be saved in this way. And it is no great problem to mechanize this production. The problem is doing it in a simple, cheap and effective way. The long periods of inactivity, usually in surroundings which make for corrosion and rust, are another problem. All machines and conveyors must either be made of material which does not corrode or rust or else be protected against corrosion.

"If the herring head could be cut off and the entrails removed before salting in a cheap and quick way, a better product would be produced and costly packing material and salt could be saved.

"The waste is of no value to the consumer, so if he pays a certain amount for a barrel of whole salted herrings there is no reason why he should not pay the same for the same quantity without heads and entrails. It must therefore be assumed that, for example, 1,000 hectoliters (205,000 a pound) of herring will represent at least the same sales value to the producer whether decapitated or not. The decisive factor is production cost in each case. By heading and gutting, about 200 barrels and 4 tons of salt per 1,000 hectoliters of raw product could be saved. At current prices, this would mean a cut of approximately 4,400 kroner (US$616) in all. In addition there is the income from sale of the waste, today a minimum of 15 kroner per hectoliter (about one U. S. cent a pound). For 1,000 hectoliters of herring this would mean approximately 3,000 kroner (US$420), in all approximately 7,800 kroner per 1,000 hectoliters (about US$0.53 a 100 pounds), by heading and gutting. If almost 8 kroner per hectoliter can be saved, it would be defensible to make quite large investments in mechanization, particularly if the producer is certain that labor costs are no higher for headless than for whole salted herring.

"This calculation is so simple and convincing that there is every reason to make an effort to find the most rational method for production of decapitated salted herring. The same applies to filleting.

"... Some heading machines, more or less efficient, exist already. Typical of all of them is that the herring must be fed in one by one by hand. This requires a good deal of manual work and limits capacity. Most of the machines are unsuitable for ships, and for the Iceland fishery in particular this is important, as the herring should be headed and gutted on board.

"The research institute at first thought to concentrate on mechanically aligning and feeding the herring to heading machines and filleting machines for land plants. However, Engineer Peter J. F. Christie of Bergen showed us plans for a heading machine constructed for use on board vessels. We found this machine so interesting that we decided to support further work on it. The machine is now completed and has been tested two seasons during the Icelandic fishery. ... Its capacity depends chiefly on how quickly herring can be fed into it. The gutting is entirely satisfactory. It requires little space and is cheap.

"There were several principles to work on in the case of aligning herring. We found a proposal presented by Engineer Christie the most promising, however, and decided to try it, particularly since this method not only aligns the herring but also delivers the herring one by one with suitable intervening spaces. A trial machine was built, and after some experimentation we have arrived at a type which seems 100 percent satisfactory as regards turning the head one way and delivering the herring singly. It also turns the belly in a certain direction, but the guarantee is not 100 percent here, as there seems to be a margin of error of 5-10 percent. For heading it is less important whether the turning of the belly is 100 percent certain, and for this purpose the machine is considered satisfactory. The machine has as yet been tried only with thawed frozen herring. If the belly is somewhat different from that of fresh fish and the herring is less smooth, there will probably be a smaller margin of error in turning the belly of fresh fish.

"The machine also aligns headed herring, which may be of some importance later, for example in filleting headed herring.

"It now remains to try this machine in regular production. The trial machine was a typical experimental type unsuitable for regular production. A prototype is now being made which will be sent on an Iceland vessel in July of this year to be tried in regular operation and find out whether it will be influenced by rough seas, which we do not think it will.

"The machine is simple and cheap and requires comparatively little space. It can take the herring from a reservoir or be supplied with smaller or larger quantities at a time, delivering the herring singly with the head turned in one direction at a speed of about 2 per second, or about 30 barrels per hour.

"It is clear that this machine could facilitate the production of headed herring, and as the machine is small and cheap several of them can be set up parallel for increased capacity. ... It can also be adjusted to filleting machines, but experiments have not yet been made in this field. The turning of the belly would have to be 100 percent certain in that case, and we expect further studies will be required."

Note: Also see Commercial Fisheries Review, July 1956, p. 85.

Panama

RECENT DEVELOPMENTS IN FISHERIES: Shrimp: This year the Gulf of Panama pink shrimp came in with the cold tides around the end of February, remained throughout March, and then left as quickly as they had appeared. Fishing for pink shrimp lasted 30 days. Because of lower prices and a dull market for pink shrimp, it was necessary to peel and devein more than half of the total catch.

The principal company (which owns about 50 shrimp trawlers and operates 10 more independent trawlers) in Panama exported to the United States in March 1956

Fig. 1 - Part of shrimp fishing fleet anchored in Panama Bay.

Fig. 2 - Bella Vista Pier and several shrimp trawlers in foreground. Taboga Island can be seen in the distance.

a total of 436,200 pounds of frozen shrimp. Included was 107,800 pounds of heads-off (average 26-30 count) pink shrimp and 102,800 pounds of peeled and deveined

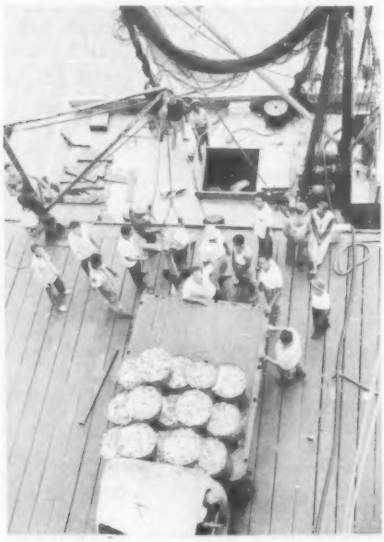


Fig. 3 - Unloading a shrimp trawler at Bella Vista Pier

Fig. 4 - Another view of Bella Vista Pier with freezing plant in background.

pink shrimp. The balance of the exports consisted of white shrimp and a small quantity of peeled and deveined "titi" (Xiphopeneus kroyeri).

The Panamanian pink shrimp have been classified by an FAO technical advisor as Peneus creviroctris and the jumbo white shrimp as Peneus occidentalis.

Corvina Fillets: Frozen corvina (Cynoscion stlozmanni) fillets are going over very well in Panama and the Canal Zone. Up to August about 6,000 pounds a month were marketed, and after August sales were expected to reach 10,000 pounds a

month because there were plans of supplying frozen corvina fillets to United States Army installations in the Canal Zone.

Fig. 5 - Shrimp in a brine-freezer tank aboard a Panamanian shrimp trawler.

Fig. 6 - Shrimp trawler tied up at Bella Vista Pier. Truck leaving pier loaded with shrimp.

Fig. 7 - Removing frozen shrimp from freezers at Bella Vista plant.

Dried Fish: One company in Panama has installed fish driers which will be capable of producing 5,000 pounds of dried corvina a day. This should more than take care of the local requirements for dried fish. About one million pounds of dried cod ("bacalao") a year is imported by Panama at present.

Fish Cannery: Plans for a fish cannery are still under discussion. The location of the cannery has not been decided upon as some favor Panama and others

Fig. 8 - Two new shrimp trawlers built in Panama.

Fig. 9 - Taboga Island showing construction and dirt movement in the foreground. (Photo taken the latter part of 1955.)

nearby Taboga Island. The projected cannery is expected to start out on a small scale and pack about 5,000 cans of fish a day to supply the local market. Later the cannery hopes to work out plans to buy frozen tuna and attempt to launch its own brand of canned tuna in the Central American market.

Byproducts Plant: The fishery byproducts reduction plant at Taboga Island is expected to be finished and operating about September. The plant can process 12 metric tons of raw fish an hour. It has not yet been determined the type of fish which will be processed.

--Carlos A. Arosemena L.,
Panama City, Panama (June 22, 1956)

Peru

WHALING ACTIVITIES: The Peruvian-Panaman-French Company which obtained a license in 1955 to use the whole quota of 2,100 sperm whales made available by the generally-unrecognized South Pacific Conservation Agreement during the year July 1, 1955, to June 30, 1956, has disbanded without ever operating. The quota applies only to pelagic whale hunting (i.e. deep-sea).

However, two shore-based companies not subject to quotas continued to kill sperm whales and a very small number of fin whales.

In June 1956 the Secretary General of the signatories of the South Pacific Conservation Agreement issued a public invitation to apply for permits for the 1956/57 quota. No whaling companies, either foreign or local (i.e. Chilean, Peruvian, or Ecuadorean) are likely to apply for the license while the shore-based companies enjoy special advantages. A new shore-based company has been formed with a capital of US$400,000 and will probably begin operating in 1956; its base will be at Tierra Colorado, just south of Paita. This company, like the other two, will kill sperm whales almost exclusively and will use no factoryship, announces a June 26 United States Embassy dispatch from Lima.

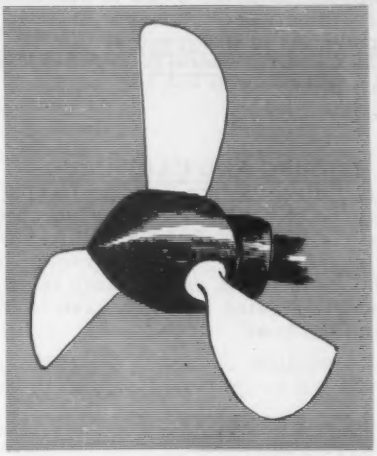
Union of South Africa

FISHING BOATS OFFERED NYLON PROPELLERS: Fishing boat owners of South Africa are showing some interest in a European-manufactured propeller made from nylon, states the April 1956 issue of The South African Shipping News and Fishing Industry Review. The nylon propeller has not only survived the most arduous tests, but its manufacturers claim that it has a number of advantages over the conventional metal propeller.

This remarkable innovation to boat propulsion was developed by technicians with nearly 40 years of experience in the development of the once startling, but now commonplace variable-pitch propeller.

After the war, when nylon was being adapted for more and more uses, a Danish firm making variable-pitch propellers was asked if it was possible to make a propeller of nylon. They examined the project and decided that it was possible if the special properties of nylon were considered.

The blades were molded to a rather rounded shape on the fore edges, something like the flippers of a small whale, and a small three-blade fixed propeller was made and tried out. It worked well and stood the tests which included running in a tub full of wood blocks and fitting it to a boat which ran it at full speed against a stony beach. The only damage consisted of a few small hacks on the blades. Realizing the advantage of a tough resilient propeller with little friction between it and the water in which it revolved, they decided to try it on variable pitch. Again it worked and so nylon propellers are now being offered to fishermen.



Among the many advantages claimed by the manufacturers are resistance to cavitation and sufficient flexibility to absorb shocks without breaking. The propellers, made of a completely inert substance, will not corrode and so might offer a solution to the problems of boats in Walvis Bay waters. These propellers, both left and right hand, are supplied with variable pitch or standard fixed type.

The manufacturing firm has now gone beyond experiments with the smaller fishing boat propeller and is now working on propellers for a 150-hp. trawler engine.

U. S. S. R.

FISHING FLEETS EXPANDING FOR DISTANT-WATER FISHING: The Russian fleet of large ocean trawlers or factoryships will be increased to 50 during the sixth five-year plan running from 1956 to 1960, according to Norwegian journalists who recently visited Russia and talked with Russian Fishery Minister Isjkov. The trawlers are equipped with freezing and filleting machinery and use a stern slipway for hauling the trawls. The first group of 14 trawlers have a cargo capacity of 600 metric tons each, carry 100 men, have 1,900- horsepower engines, and fish for both cod and herring, according to reports in the Norwegian fishery journals Fiskets Gang (June 21) and Fiskaren (May 30).

Since the trawlers are too large to go through the White Sea Canal, they must go back and forth along the Norwegian Coast between Tallin and Leningrad in the Baltic Sea and Murmansk and Archangel in the North.

The Russian herring fleet off the Norwegian coast was reported to number 300 units. Fifty vessels have conducted extensive herring research and now know exactly the herring migrations from Norway to the Baltic Sea and Murmansk.

In further conversations with Russian Rear Admiral Burkhanov, Director for the Administration of the Northern Sea Routes and Viceminister for the Ocean Fleet, it was reported that there are five Arctic weather observatories supplemented by smaller coastal stations and four floating icefield stations. The stations make the usual meteorological observations, conduct ocean research and other research in connection with navigation. The Northern Sea route is now kept open 3 to 4 months each year, but the goal of the sixth five-year plan is to increase this to 5 to 6 months.

This will be accomplished with the regular icebreakers. An icebreaker with atomic engines will be tested during the five-year plan but cannot be set into operation until after 1960. The longer navigating season will be of considerable importance to the Soviet fisheries since it will then be possible to shift the new trawler fleet back and forth between the North Atlantic and the North Pacific to areas where the fishing potential is the greatest.

Note: See Commercial Fisheries Review January 1955, p. 69; April 1955, p. 75; June 1955, p. 91; July 1955, p. 72; October 1955, p. 83; and December 1955, p. 64.

* * * * *

HERRING AND CARP CAUGHT WITH SUCTION HOSE: Herring and carp are pumped directly into Russian fishing vessels in the Caspian Sea, according to an executive of the Norwegian Fishermen's Association who witnessed the operation while visiting Russia as a member of a Norwegian fishery delegation. He reported to Fiskaren (May 30), a Norwegian fishery journal, that a hose is lowered to a depth of 100 meters. A strong lamp is attached to the end of the hose. When an echo sounder indicates that fish have been drawn to the hose by the lamp, they are pumped into the boat.

* * * * *

FISH PRESERVED BY ELECTRICAL SHOCK: An electric shock is used to preserve some fish for marketing in Russia, according to an executive of the Norwegian Fishermen's Association while visiting Russia as a member of a Norwegian fishery delegation. He reported to Fiskaren (May 30), a Norwegian fishery periodical, that the fish in well boats were stunned with an electrical shock and then placed in crushed ice in barrels. Even after being in transit 2 or 3 days the fish could be sold as living fish.

United Kingdom

GRIMSBY TO HOLD FISHING INDUSTRY EXHIBITION: A Grimsby Fishing Industry Exhibition was scheduled to be held September 1-8, 1956, in celebration of the Centenary of the opening of the first Fish Dock at that port. The Exhibition was to portray the size and scope of the fishing industry at Grimsby which ranges from the largest distant-water trawlers to inshore fishing vessels. All aspects of the fishing industry was to be covered.

To commemorate the event, social and other functions are being arranged during Centenary Week in Grimsby, one of the largest fishing ports in the world.

Venezuela

TUNA LONG-LINER RETURNS TO JAPAN: The Japanese long-line tuna vessel Bozo Maru, which started to fish experimentally for tuna off Venezuela about December 14, 1955, returned to Japan on June 2, according to a Venezuelan press report of May 31. The vessel returned to Japan with 200 tons of frozen tuna. The results of the Venezuelan venture are now being studied with a view to forming a joint Venezuelan-Japanese company to bring four Japanese vessels, of the same type as the Bozo Maru, to Venezuela in November 1956.

The 200 tons of tuna taken to Japan were said to be for the purpose of studying the canning characteristics of these tuna. Other reports indicate that the tuna were

unsalable in Venezuela due to the absence of canning facilities and lack of appeal to the Venezuelan consumer. Some attempts were made to sell the tuna at retail for as low as US$0.22, but apparently the Venezuelan consumer preferred to pay about US$0.74 for red snapper at retail.

MORE GLAMOROUS AND ECONOMICAL FISHERY PRODUCTS ON THE WAY

A new day is dawning for the American housewife as far as her food problems go; new, more glamorous, and economical foods are on their way to her in fishery products.

This was the prediction made on April 18, 1956, by Frank W. Wilkisson, of New York, upon election as president of the National Fisheries Institute, at its Eleventh Annual Convention in Miami Beach, Fla.

"The fisheries business is growing out of its swaddling clothes so far as knowing and appealing to the housewife and her family," said Wilkisson. "While fish products have been part of the American menu since the founding of our nation, it is only in the past few years that we have realized that our products can be merchandised and sold to the consumer in new and more effective ways.

"There was a time when fisheries foods were largely consumed on the nation's coasts. But that day is rapidly passing. Today the housewife can get varieties of our products in the innermost sections of the nation; brought to her in the most modern methods of refrigeration.

"Fish products have always been glamorous in the eyes of the American people. We have managed to preserve their glamor at the same time developing newer and more attractive ways of preparation and presentation. Not only is this true in precooked fish such as fish sticks, but it is also true of fresh fish products."

Wilkisson said that Americans are eating more fishery products than ever before and he anticipates that increased consumption will continue for some years to come, because the housewife is always looking for new, economical, and glamorous foods to serve her family and fish products offer all three.

At the same time, hotels and restaurants are finding increasing demand for fishery products, he said. Americans are eating out and they are getting a thorough sampling job done on them on fish and seafoods because of the large place hotels and restaurants are giving to these items on their menus.

Asked about the long-range situation on availability of fish products, Wilkisson said he cannot foresee any shortage for years to come. The problem of fishing rights off the coasts of nations is giving the industry some concern at the moment, he pointed out, but added he felt sure these problems would be worked out through conference and arbitration without causing any hardship on the processors or retailers of the products.

--Excerpt from address at National Fisheries Institute Eleventh Annual Convention, April 18, 1956.

FEDERAL ACTIONS

Department of Agriculture

FISH-STICK STANDARD ESTABLISHED: Through the combined efforts of the commercial fishing industry, the Department of the Interior, and the Department of Agriculture, quality standards that

Recording score for quality factors of fish sticks.

proved so valuable as a marketing aid for agricultural products will soon become available for fish and fishery products, Secretary of the Interior Fred A. Seaton announced July 25.

Official notice of final rule making for voluntary United States standards for grades for frozen fried fish sticks were published in the Federal Register of July 21, 1956. The standards will become effective on August 20, 1956.

Funds made available by Public Law 466, 83rd Congress, commonly referred to as the Saltonstall-Kennedy Act, have been used to expedite the program of the U. S. Fish and Wildlife Service for the development of voluntary Federal standards. The National Fisheries Institute, acting as a contract research agency for the Fish and Wildlife Service, has supplied the industry liaison essential to the standards program and has supplied consulting services at meetings and conferences on standards. A committee of industry technologists, representative of fish-stick producers and distributors, actively cooperated with the Service's scientific staff in the studies of frozen fried fish sticks (selected as the product of highest priority by the fishing industry) and of processing procedures required to insure development of realistic and practical standards. The Department of the Interior has developed the standards program for fish and fishery products and conducted research required to develop or revise the standards.

When the standards become effective, the Department of Agriculture will offer an inspection and certification service on a fee basis upon request by any financially-interested party. Such inspections will aid in quality control and in facilitating marketing of the products.

The standards for frozen fried fish sticks apply to whole, rectangular-shaped portions of fish meat, breaded, precooked and frozen. The grades include "U. S. Grade A" and "U. S. Grade B." Quality below these grades would be classified as "Substandard."

Products to be graded must conform to the industry-accepted definition of the product. The most important elements of the definition require that only one species of fish be used in a package, that the fish meat be composed of fillet portions, and that the product consist of at least 60 percent by weight of fish meat.

The standards do not define proper labeling nomenclature for this product. Frozen fried fish sticks, when sold in interstate commerce, must conform to the labeling regulations of the Food and Drug Administration, Department of Health, Education, and Welfare.

The standard as published in the Federal Register follows:

TITLE 7—AGRICULTURE

Chapter I—Agricultural Marketing Service (Standards, Inspections, Marketing Practices), Department of Agriculture

PART 52—PROCESSED FRUITS AND VEGETABLES, PROCESSED PRODUCTS THEREOF AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

SUBPART—UNITED STATES STANDARDS FOR GRADES OF FROZEN FRIED FISH STICKS [1]

On April 26, 1956, a notice of proposed rule making was published in the FEDERAL REGISTER (21 F. R. 2687) regarding a proposed issuance of United States Standards for Grades of Frozen Fried Fish Sticks.

After consideration of all relevant matters presented, including the proposal set forth in the aforesaid notice, the following United States Standards for Grades of Frozen Fried Fish Sticks are hereby promulgated pursuant to the authority contained in the Agricultural Marketing Act of 1946. (60 Stat. 1087, et seq., as amended; 7 U. S. C. 1621 et seq.)

PRODUCT DESCRIPTION AND GRADES

Sec.
52.3141 Product description.
52.3142 Grades of frozen fried fish sticks.

WEIGHTS AND DIMENSIONS

52.3143 Recommended weights and dimensions.

FACTORS OF QUALITY

52.3144 Ascertaining the grade for frozen fried fish sticks.
52.3145 Ascertaining the score for the factors which are rated.
52.3146 Appearance.
52.3147 Defects.
52.3148 Character.

DEFINITIONS AND METHODS OF ANALYSIS

52.3149 Definitions and methods of analysis.

LOT CERTIFICATION TOLERANCES

52.3150 Tolerances for certification of officially drawn samples.

SCORE SHEET

52.3151 Score sheet for frozen fried fish sticks.

AUTHORITY: §§ 52.3141 to 52.3151 issued under sec. 205, 60 Stat. 1090, as amended; 7 U. S. C. 1624.

PRODUCT DESCRIPTION AND GRADES

§ 52.3141 *Product description.* Frozen fried fish sticks are clean, wholesome, rectangular-shaped portions of breaded, pre-cooked, and frozen fish flesh. The portions of fish flesh, composed primarily of large pieces, are coated with a suitable batter and breading; are cooked by frying in suitable oil or fat; and are frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product. Frozen fried fish sticks contain not less than 60 percent, by weight, of fish flesh. All sticks comprising an individual package are prepared from the flesh of only one species of fish.

§ 52.3142 *Grades of frozen fried fish sticks.* (a) "U. S. Grade A" is the quality of frozen fried fish sticks that possess a good flavor and odor, that possess a good appearance, that are practically free from defects, that possess a good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 85 points: *Provided*, That the frozen fried fish sticks may possess a reasonably good appearance and a reasonably good character if the total score is not less than 85 points.

(b) "U. S. Grade B" is the quality of frozen fried fish sticks that possess a reasonably good flavor and odor, that possess a reasonably good appearance, that are reasonably free from defects, that possess a reasonably good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 70 points: *Provided*, That the frozen fried fish sticks may fail to possess a reasonably good appearance and fail to possess a reasonably good character if the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen fried fish sticks that fail to meet the requirements of U. S. Grade B.

WEIGHTS AND DIMENSIONS

§ 52.3143 *Recommended weights and dimensions.* The recommended weights and dimensions of frozen fried fish sticks are not incorporated in the grades of the finished product since weights and dimensions, as such, are not factors of quality for the purposes of these grades. It is recommended that the largest dimension of a fish stick be at least three times that of the next largest dimension and that the average weight of the individual sticks be not less than ¾ ounce and not greater than 1¼ ounces.

FACTORS OF QUALITY

§ 52.3144 *Ascertaining the grade.* (a) *General.* In addition to considering other requirements outlined in the standards, the following quality factors are evaluated in ascertaining the grade of the product:

(1) *Factor not rated by score points.* (i) Flavor and odor.

(2) *Factors rated by score points.* The relative importance of each factor which is rated is expressed numerically on the scale of 100. The maximum number of points that may be given such factors are:

Factors:	Points
Appearance	35
Defects	40
Character	25
Total score	100

(b) The grade of frozen fried fish sticks is ascertained by observing the product in the frozen state and after it has been heated in a suitable manner.

(c) *Good flavor and odor.* "Good flavor and odor" means that the product has the good flavor and odor of properly prepared breaded fish sticks. The flesh portion has the good flavor and odor of properly prepared fish of the particular species. The coating has the good flavor and odor obtained when all components have been properly prepared, used, and maintained. The product is free from rancidity, bitterness, and staleness, from bacterial spoilage flavors and odors, and from off-flavors and off-odors of any kind.

(d) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" means that the product may be somewhat lacking in good flavor and odor, but is free from rancidity and from objectionable bacterial spoilage flavors and odors, and from off-flavors and off-odors of any kind.

§ 52.3145 *Ascertaining the score for the factors which are rated.* The essential variations within each factor which is rated are so described that the value may be ascertained for each factor and expressed numerically. The numerical range within each factor which is rated is inclusive. (For example, "21 to 25 points" means 21, 22, 23, 24, or 25 points.)

§ 52.3146 *Appearance.*—(a) *General.* The factor of appearance refers to the uniformity of size and shape of the frozen sticks, the color of the heated sticks, and the continuity of the coating of the product after heating.

(b) *(A) classification.* Frozen fried fish sticks that possess a good appearance may be given a score of 30 to 35 points. "Good appearance" means that the sticks are practically uniform in size and shape; that the product after heating possesses a practically uniform light brown to golden brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not more than slightly affected by cracking or slipping.

(c) *(B) classification.* Frozen fried fish sticks that possess a reasonably good appearance may be given a score of 25 to 29 points. "Reasonably good appearance" means that the sticks are reasonably uniform in size and shape; that the product after heating possesses a reasonably uniform light brown to golden-brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not materially affected by cracking or slipping.

(d) *(SStd.) classification.* Frozen fried fish-sticks which fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 24 points, and shall not be graded above U. S. Grade B regardless of the total score of the product (this is a partial limiting rule).

§ 52.3147 *Defects.*—(a) *General.* The factor of defects refers to the degree of freedom from bones, broken sticks, damaged sticks, and from blemishes.

(1) *Bones.* "Bones" means any bones that can be separated from the product, can be identified, and are of such character as to be potentially harmful.

(2) *Broken stick.* "Broken stick" means a fish stick which is separated in two or more parts or is strained apart to the extent that it cannot be readily handled as one stick.

[1] Compliance with these standards does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

(3) *Damaged stick.* "Damaged stick" means a fish stick which has been crushed or otherwise mutilated to the extent that its appearance is materially affected.

(4) *Blemished.* "Blemished" means the presence (in or on the fish flesh) of blood spots, bruises, skin, protein curd spots, and objectionable dark layer fat, and (on or in the coating) of burned material, dark carbon specks, and other harmless extraneous material.

(5) *Seriously blemished.* "Seriously blemished" means blemished to the extent that the appearance is seriously affected.

(b) (*A*) *classification.* Frozen fried fish sticks that are practically free from defects may be given a score of 34 to 40 points. "Practically free from defects" means that:

(1) None of the sticks are broken;

(2) The sticks may be blemished to only a minor degree; and

(3) Not more than a total of 20 percent, by count, of the sticks may be damaged or contain bones: *Provided,* That bones may be present in not more than 10 percent, by count, of all the sticks.

(c) (*B*) *classification.* Frozen fried fish sticks that are reasonably free from defects may be given a score of 28 to 33 points. Frozen fried fish sticks that fall into this classification may not be graded above U. S. Grade B regardless of the total score for the product (this is a limiting rule). "Reasonably free from defects" means that not more than a total of 30 percent, by count, of the sticks may be defective because of bones, or are damaged sticks, broken sticks, or seriously blemished sticks: *Provided,* That

(1) Not more than 10 percent, by count, may be broken sticks;

(2) Not more than 30 percent, by count, may be damaged sticks;

(3) Not more than 20 percent, by count, of the sticks may contain bones; and

(4) Not more than 10 percent, by count, of the sticks may be seriously blemished.

(d) (*SStd.*) *classification.* Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 27 points, and may not be graded above substandard regardless of the total score for the product (this is a limiting rule).

§ 52.3148 *Character — (a) General.* The factor of character refers to the presence or absence of free oil in the package and its effect on the condition of the package; the ease of separating the frozen sticks without damaging the coating or breaking the sticks; the tendency of the sticks to remain whole and unbroken when they are heated, handled, and served in the normal manner; the degree of freedom of the breading from either an oiliness or crumbliness; the tenderness and moistness of the flesh; the consistency of the breading in the heated product; and the adherence of the coating of the heated product.

(b) (*A*) *classification.* Frozen fried fish sticks that possess a good character may be given a score of 21 to 25 points. "Good character" means that oil from the product does not more than slightly damage the package; that there may be present not more than a very small amount of loose breading in the package; that the sticks may be separated easily; that the sticks are not more than very slightly damaged by the normal handling incident to heating and serving; that no excess oil remains on the cooking utensil; that the breading is not more than slightly oily; that the flesh after heating has a good texture which is firm, tender and moist, characteristic of properly fried fish sticks for the species used; and that after heating the coating has a good crisp, tender texture not more than slightly affected by blistering or wrinkling.

(c) (*B*) *classification.* Frozen fried fish sticks that possess a reasonably good character may be given a score of 17 to 20 points. "Reasonably good character" means that oil from the product does not materially damage the package; that there may be present not more than a reasonable amount of loose breading in the package; that the sticks may be separated with only moderate damage to the coating; that the sticks are not more than moderately damaged by the normal handling incident to heating and serving; that the breading is not more than moderately oily; that the flesh after heating has a reasonably good texture which is not more than moderately tough, stringy, crumbly, mushy or spongy; and that after heating the coating has a reasonably good texture which may be not more than moderately pasty, mushy, tough, or crumbly and is not materially affected by blistering or wrinkling.

(d) (*SStd.*) *classification.* Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 16 points and shall not be graded above U. S. Grade B regardless of the total score for the product (this is a partial limiting rule).

DEFINITIONS AND METHODS OF ANALYSIS

§ 52.3149 *Definitions and methods of analysis—(a) Percent of fish flesh.* "Percent of fish flesh" means the percent, by weight, of fish flesh in an individual package as determined by the following method:

(1) *Equipment needed.* (i) Water bath (2 to 3 liter beaker).

(ii) Balance, accurate to 0.05 gm.

(iii) Paper towels.

(iv) Spatula, small with curved tip.

(2) *Procedure.* (i) Remove from 0° F. storage and obtain the weight of each stick in the package while still in a hard frozen condition.

(ii) Place each stick individually in the water bath (maintained at 17° to 30° C.—63° to 86° F.) and allow to remain for 25 seconds. Remove from the bath; blot off lightly with double thickness paper toweling; scrape off coating with spatula; and weigh the fish flesh portion of the stick.

(iii) Calculate the percent of fish flesh in the package by the following formula:

$$\frac{\text{Total weight of fish flesh}}{\text{Total weight of frozen sticks}} \times 100 = \text{percent fish flesh.}$$

(c) *Heating in a suitable manner.* "Heating in a suitable manner" means heating in accordance with the recommendations accompanying the product. However, if specific instructions are lacking, the product should be heated as follows:

(1) Place the product while still in the frozen state on a flat or shallow pan of sufficient size that at least 10 ounces of the product can be spread evenly on the pan with no portion of a stick closer than ¼ inch to another or to the edge of the pan.

(2) Place the pan and frozen contents in a properly ventilated oven pre-heated to 400 degrees Fahrenheit and remove when the product is thoroughly heated.

LOT CERTIFICATION TOLERANCES

§ 52.3150 *Tolerances for certification of officially drawn samples.* (a) The grade of a specific lot from which samples have been officially drawn may be certified on the basis of such samples: *Provided,* That (1) all packages contain one species of fish; (2) all packages meet applicable provisions of the Federal Food, Drug, and Cosmetic Act in effect at the time of the aforesaid certification; *And provided further,* That, with respect to those factors which are rated by score points, such grade will be determined by averaging the total scores, if:

(i) Not more than one-sixth of the packages fail to meet the grade indicated by the average of such total scores;

(ii) None of the packages fall more than one grade below the grade indicated by the average of such total scores; and

(iii) The average score of all packages for any factor subject to a limiting rule is within the score range of that factor for the grade indicated by the average of the total scores of the packages comprising the sample.

SCORE SHEET

§ 52.3151 *Score sheet for frozen fried fish sticks.*

Label.....
Size and kind of container.....
Species of fish.....
Container mark or identification.....
Size of lot.....
Number of samples.....
Net weight (ounces).....
Number of sticks per container.....

Factors		Score points
Appearance	35	(A) 30-35 (B) 26-29 (SStd.) [1] 0-24
Defects	40	(A) 34-40 (B) [2] 28-33 (SStd.) [1] 0-27
Character	25	(A) 21-25 (B) 17-20 (SStd.) [1] 0-16
Total score	100	

Grade.....
Flavor.....

[1] Indicates partial limiting rule.
[2] Indicates limiting rule.

Effective time. The United States Standards for Grades of Frozen Fried Fish Sticks (which is the first issue) contained in this subpart shall become effective 30 days after publication hereof in the FEDERAL REGISTER.

Dated: July 18, 1956.

[SEAL] FRANK E. BLOOD,
Acting Deputy Administrator,
Marketing Services.

Note: Also see Commercial Fisheries Review, June 1956, p. 83.

Department of the Interior

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE SERVICE REORGANIZATION DEFERRED PENDING CONGRESSIONAL ACTION:

Because Congress is considering legislation affecting the Fish and Wildlife Service, administrative reorganization of that Service, scheduled to go into effect July 1, was temporarily deferred, with the President's approval, Secretary of the Interior Fred A. Seaton announced July 3.

The Department has been working out details of the reorganization plan since June 4, when a White House directive spelled out the objectives of the Administration's proposal to provide new forms of assistance to the commercial fishing industry and to bolster other services performed by the Fish and Wildlife Service.

Secretary Seaton said the Department had decided to postpone completion of the reorganization until Congress has had an opportunity to act on pending legislation designed to accomplish essentially the same things as the administration's program.

The Secretary said H.R. 11570 is generally in accord with the President's program.

"In view of the fact that the Congress is now considering legislation that would, among other things, provide for the reorganization of the Fish and Wildlife Service to include a bureau of wildlife and sport fishing and a bureau of commercial fisheries, it would seem best at this time for the Department to delay effectuating its own reorganization plan beyond the originally contemplated July 1 target date," Seaton said.

"This is a complex problem and it is the President's desire that the Department of the Interior and other interested Federal agencies cooperate to the utmost with the Congress in working out the best possible solution to the problem," he added.

In addition to providing for reorganization of the Fish and Wildlife Service, H.R. 11570, as reported by the House Committee on Merchant Marine and Fisheries, calls for establishment within the Department of the Interior of an Assistant Secretary to have supervision of fisheries and wildlife and a Commissioner of Fish and Wildlife. Other significant features of the bill are a revolving loan fund and a continuation of the Saltonstall-Kennedy program which would eliminate the present $3,000,000 limitation on funds for fisheries research and other projects. The Saltonstall-Kennedy Act of 1954 is due to expire next year.

The administration's proposed legislation, submitted to Congress on June 7 provided for a $10,000,000 revolving loan fund for the maintenance and repair of commercial fishing vessels and for liberalization of the Saltonstall-Kennedy Act.

* * * * *

NOTICE OF INTENTION TO ADOPT AMENDMENTS TO ALASKA COMMERCIAL FISHERIES REGULATIONS:

Notice of intention to adopt amended regulations permitting and governing the time, means, and methods for taking commercial fish and shellfish in waters of Alaska was published in the Federal Register of July 18, 1956. The regulations are to become effective beginning about February 1, 1957, and to continue in effect thereafter until further notice.

Interested persons may participate in considering changes in the regulations by submitting their views, data, or arguments in writing to the Director of the Fish and Wildlife Service, Department of the Interior, Washington 25, D. C., on or before November 20, 1956, or by presenting their views at a series of open discussions scheduled as follows:

Dillingham, Alaska--October 1, 1956
Anchorage, Alaska--October 3, 1956
Homer, Alaska--October 4, 1956
Kodiak, Alaska--October 6, 1956
Cordova, Alaska--October 8, 1956
Juneau, Alaska--October 15, 1956
Sitka, Alaska--October 16, 1956
Ketchikan, Alaska--October 18, 1956

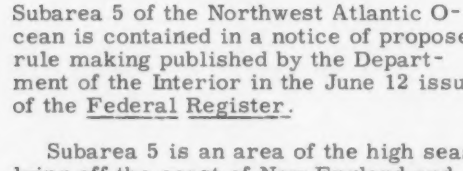
Wrangell, Alaska--October 19, 1956
Seattle, Wash.--November 7, 8, and 9, 1956

The hour and place of each meeting will be announced by the local representative of the U. S. Fish and Wildlife Service at the places indicated.

* * * * *

PROPOSED REVISED REGULATIONS FOR NEW ENGLAND HADDOCK FISHERY:

The text of new regulatory provisions to provide for the registration of vessels to be used in the taking of haddock within



Haddock

Subarea 5 of the Northwest Atlantic Ocean is contained in a notice of proposed rule making published by the Department of the Interior in the June 12 issue of the Federal Register.

Subarea 5 is an area of the high seas lying off the coast of New England and is one of five separately-described areas of the high seas covered by the International Convention for the Norwest Atlantic Fisheries, signed at Washington, February 8, 1949. Vessels registered for use in the haddock fishery will be required to use trawl nets having a minimum mesh size of $4\frac{1}{2}$ inches.

The new regulations are to be adopted in the interest of more effective enforcement of a minimum mesh-size restriction which has been in effect since 1953. The mesh-size restriction was adopted in that year following a proposal by the ten-nation International Commission for the Northwest Atlantic Fisheries. Experience gained during three years of operations has indicated the desirability of effecting these changes which will be helpful in obtaining industrywide compliance with the requirements of the regulations.

For many years, prior to the adoption of the regulations, haddock fishermen using nets having an inside measurement as small as $2\frac{7}{8}$ inches caught haddock which were too small to be marketed. These small haddock were discarded at sea. The present regulations, based upon knowledge obtained through extensive research into the rates of growth and mortality of haddock, specifies a minimum mesh size of $4\frac{1}{2}$ inches inside measure which has the effect of permitting immature haddock to escape unharmed from the nets. Since adoption of the new fishing practices in 1953, biologists of the U. S. Fish and Wildlife Service estimate that several million pounds of young fish have been left in the sea each year for capture at a future time when they will have grown to a more desirable size.

These regulations are designed to give effect to a proposal adopted in 1952 by the International Commission for the Northwest Atlantic Fisheries which recommended that the contracting governments take appropriate action to prohibit the taking of haddock in Subarea 5 with a trawl net having a mesh size of less than $4\frac{1}{2}$ inches. This recommendation was made in the interest of permitting an adequate escapement of immature haddock which, in turn, would contribute materially toward increasing the level at which the maximum sustainable catch of this species might be maintained.

The Commission's recommendation was first implemented by regulations adopted by the Secretary which became effective May 31, 1953 (50 CFR Part 155, 18 F.R. 2414, April 24, 1953). These regulations were experimental in nature so far as they related to the size of the meshes of trawl nets and by their terms were to be effective for the year 1953 only. As an aid to enforcement, the regulations were made applicable to the entire convention area although the Commission's recommendation for mesh size restrictions applied only to Subarea 5. In addition to prohibiting United States fishermen from taking haddock in all of the subareas of the convention area with a trawl net having a mesh size of less than $4\frac{1}{2}$ inches, the regulations prohibited the possession or transportation on a vessel at any one time of both a prohibited trawl net and haddock in excess of 5,000 pounds or ten percent of all fish on board, whichever was larger. Late in 1953, a number of vessel operators were apprehended at Massachusetts ports and were charged with violating the regulations through possessing undersized trawl nets and haddock in excess of the exempted quantities. These cases subsequently were disposed of upon pleas of guilty or nolo contendere, resulting in fines ranging from $15 to $250.

Effective January 1, 1954 (18 F.R. 8903, December 31, 1953), revised regulations of unlimited duration were adopted to implement a second proposal recommended by the Commission relating to the taking of haddock in Subarea 5. These regulations continued the $4\frac{1}{2}$-inch minimum mesh size restriction and prescribed a procedure for determining equivalent wet and dry mesh sizes. The

regulations also established a procedure under which trawl nets could be certified and approved by the Fish and Wildlife Service for use in haddock fishing. Although the regulations continued to apply to the entire convention area, the prohibition against the possession of haddock and an undersized net was eliminated because it was regarded as being merely a rule of evidence which, in the circumstances presented, probably exceeded the authority of the Secretary. Difficulties in proving violations arose under the amended regulations because several suspected violators had not been detected at sea using undersized nets and no means were available for establishing that small mesh nets had been used in taking haddock in quantities affected by the regulations. As a result, the criminal actions instituted against a number of vessel operators who had been apprehended upon arrival in port during the early part of 1954 were later dismissed because of the absence of evidence sufficient to obtain convictions.

In a memorandum, dated September 12, 1955, the Solicitor reviewed extensively the authority of the Secretary to prescribe regulations governing the taking of haddock in the Northwest Atlantic Ocean and concluded that in the light of the Commission proposals which thus far have entered into force the regulations cannot be made applicable to any waters beyond Subarea 5. He also concluded that no provisions designed to serve as a rule of evidence can be included in the regulations. In view of these conclusions and as a practical aid to effective enforcement, the Solicitor suggested that a licensing or registration system be prescribed by regulations as a means of determining those persons who fish for haddock in Subarea 5 and are thus amenable to regulation, including a prohibition against the possession of undersized trawl nets.

The draft of proposed revised regulations as published in the June 12 Federal Register is designed to carry the suggestions of the Solicitor into effect. Significant proposed changes in and additions to the existing regulations are commented on below:

1. Section 155.1 is largely self-explanatory and is retained as a part of the regulations to afford legal definitions for the terms used elsewhere in the regulations. These definitions follow closely those employed in the existing regulations. It should be observed, however, that the definition of "haddock fishing" has been enlarged to include "the outfitting and departure of a vessel for or the return of a vessel from haddock fishing." The inclusion of these acts will enlarge the basis for enforcement activities at ports within territorial waters involving haddock taken within Subarea 5 by registered haddock fishing vessels. Another significant change in §155.1 is the inclusion of a definition of the "regulatory area" to delimit the boundaries of Subarea 5 of the convention area. When revised in accordance with the present proposals, these regulations will have application only to the taking of haddock in Subarea 5.

2. A major change in the regulations is represented by the addition of §155.2. Subsection (a) of this section will require that persons who propose to engage in haddock fishing in Subarea 5 shall first register their vessels and obtain a haddock registration certificate by following the procedures specified in subsection (b). Subsection (c) of §155.2 will require that the haddock registration certificate be carried on board the vessel for which it is issued and that the certificate, the vessel, its gear and equipment shall at all times be subject to inspection by officers authorized to enforce the regulations. The primary purpose of the registration requirement is to afford a means by which persons fishing for haddock in Subarea 5 may be distinguished from those who fish for haddock in nonregulated waters of the convention area or fish for species in Subarea 5 other than haddock.

3. (a) Section 155.3(a) would make it unlawful for any person to possess on board a registered haddock fishing vessel or to use or attempt to use from such vessel a trawl net having a mesh size of less than $4\frac{1}{2}$ inches as determined in accordance with the methods of measuring fishing gear prescribed in subsections (b), (c) and (d) of §155.3.

(b) Subsection (d) would be amended to substitute "120-thread cotton" for the present "109-thread cotton" to correct an error made when this subsection was adopted late in 1953. Moreover, all reference to nylon twine would be deleted from this subsection pending completion of studies by the Service to determine the behavior of cod ends constructed of nylon twine of various sizes. This change has become particularly important with the recent use of cod ends constructed from war-surplus braided nylon parachute cord. Depending upon a variety of factors in the use of these cod ends, the twine swells and "fuzzes up," becoming at least double the original diameter of the braided cord. This results in a mesh size considerably less than the $4\frac{1}{2}$-inch minimum permitted under the regulations. Certification and approval for haddock fishing should be discontinued on all nylon-thread cod ends until the Service is in a position to determine what dry mesh size will be equivalent to not less than four and one-half inches when wet after use.

(c) The present subsection (f) of §155.3 will be redesignated (g) and a new subsection (f) will have the effect of invalidating the seals attached by Service representatives to dry mesh cod ends certified and approved by them for use in haddock fishing whenever such cod ends are repaired, altered or otherwise modified subsequent to such certification. This additional provision is proposed for inclusion in the regulations to forestall any contention which otherwise might be made that a cod end having a seal attached is a net of approved mesh size notwithstanding the fact that the net has been materially altered subsequent to certification. In some instances, whole sections of cod ends have many times been replaced while leaving seals intact. No assurance can be had that "sealed" nets when so altered still produce the degree of selectivity contemplated by the $4\frac{1}{2}$-inch mesh restriction. The effect of the new subsection (f) will be to place cod ends which have been altered subsequent to certification in the same category as nets which have never been certified, thus placing responsibility upon the fisherman to insure that altered nets with seals remaining attached comply with the mesh-size restriction.

4. Section 155.4 prescribes a procedure under which the registration certificate issued for a fishing vessel may be suspended temporarily and thus permit gear having small meshes to be possessed

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
OFFICE OF THE REGIONAL DIRECTOR
59 Temple Place
Boston 11, Massachusetts

HADDOCK REGISTRATION CERTIFICATE

The vessel _____, official number _____, home port _____, owned by _____ and operated by _____, is registered pursuant to the provisions of Part 155, Title 50, Code of Federal Regulations, for the purpose of engaging in haddock fishing in Subarea ____ of the Convention Area of the International Convention for the Northwest Atlantic Fisheries, signed at Washington, February 8, 1949, for the period _____, 19__ through December 31, 19__.

The following provisions of Part 155, Title 50, Code of Federal Regulations, are quoted for the information of the operator of the vessel:

"§ 155.2(c) The haddock registration certificate so issued by the Fish and Wildlife Service shall be carried on board the vessel for which it is issued at all times and such certificate, the vessel, its gear and equipment shall at all times be subject to inspection by officers authorized to enforce the regulations in this part."

"§ 155.3 Restrictions on fishing gear. (a) No person shall possess at any time on board a vessel for which a haddock registration certificate is in force, or use or attempt to use from such vessel, a trawl net or nets, parts of nets or netting having a mesh size of less than four and one-half inches as defined in [subparagraphs (b), (c), and (d) of] this section."

"§ 155.4 Temporary suspension of haddock registration certificates. (a) The owner or operator of any fishing vessel which is proposed to be used in haddock fishing beyond the limits of the regulatory area or is proposed to be used in fishing within such area for species of fish other than haddock, may obtain a temporary suspension of the haddock registration certificate issued for such vessel for the specified period during which such nonregulated fishing is to be conducted.

"(b) Temporary suspension of haddock registration certificates shall be granted upon oral or written request, specifying the period of suspension desired, by an authorized officer of one of the following agencies: Fish and Wildlife Service, Coast Guard, Bureau of Customs, and Post Office Department. Such officer shall make appropriate endorsement on the certificate form evidencing the duration of its suspension."

_____ _____
Signature of vessel (owner) (operator) (date)

_____ _____
Regional Director (date)

[SEE REVERSE]

SUSPENSIONS

1. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

2. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

3. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

4. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

5. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

6. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

7. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

8. Suspended for the period _____ to _____.
_____
Signature and title of officer suspending

Front and back of proposed Haddock Registration Certificate.

on and used from a vessel when a person desires to engage in haddock fishing outside of Subarea 5 or to fish within that area for species of fish other than haddock. During the period covered by the temporary suspension of the haddock registration certificate the vessel affected by the suspension would not be engaged in haddock fishing within the meaning of these regulations and there would be no bar to the possession or use of fishing gear having a mesh size less than the prescribed minimum of 4½ inches. It is to be understood, of course, that during the period of certificate suspension the affected vessel could be used to take haddock only in convention waters outside the limits of Subarea 5 or for taking species of fish other than haddock within Subarea 5. Subsection (b) of this section contemplates that temporary suspensions of haddock registration certificates may be granted by authorized officers of any one of the following Federal agencies: Fish and Wildlife Service, Coast Guard, Bureau of Customs, and Post Office Department. Tentative assurances of cooperation in the performance of this limited function have been obtained through discussions with representatives of the agencies named which are not within this Department. These assurances will be reduced to writing before the revisions in the regulations are finally adopted.

5. Subsections (a), (b), and (c) of §155.5 restate the exemptions presently contained in the haddock regulations and would continue to permit the persons and vessels therein described to possess and transport haddock without regard to the requirements of the regulations.

The text of the proposed regulations which appeared in the June 12 Federal Register follows:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 155]

NORTHWEST ATLANTIC COMMERCIAL FISHERIES

HADDOCK PROVISIONS

NOTICE OF PROPOSED RULE MAKING

Experience gained since the initial adoption of regulations effective May 31, 1953 (18 F. R. 2414), prescribing restrictions on trawling nets used in the taking of haddock in the Northwest Atlantic Ocean, has demonstrated a need for further revisions in the regulations to make the same more effective.

In accordance with section 4 (a) of the Northwest Atlantic Fisheries Act of 1950, proposed amendments to the regulations were submitted to the Advisory Committee to the United States Commissioners on the International Commission for the Northwest Atlantic Fisheries on March 26, 1956, at which time the proposed revised regulations received the approval, in principle, of the Advisory Committee.

Notice is hereby given, pursuant to section 4 (a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), that the Secretary of the Interior proposes to adopt the regulations set forth in tentative form below to replace Part 155—Haddock Provisions. The proposed regulations to be issued under the authority contained in section 7 (a) of the Northwest Atlantic Fisheries Act of 1950 (64 Stat. 1067; 16 U. S. C. 981), are as follows:

Sec.
155.1 Meaning of terms.
155.2 Haddock registration certificates.
155.3 Restrictions on fishing gear.
155.4 Temporary suspension of haddock registration certificates.
155.5 Certain persons and vessels exempted.

AUTHORITY: §§ 155.1 to 155.5 issued under sec. 1, 64 Stat. 1067; 16 U. S. C. 981.

§ 155.1 *Meaning of terms.* When used in the regulations in this part, unless the context otherwise requires, terms shall have the meanings ascribed hereinafter in this section.

(a) *Regulatory area.* The words "regulatory area" mean that portion of the Convention area, including all waters except territorial waters, bounded by a line beginning at the terminus of the international boundary between the United States of America and Canada in Grand Manan Channel at a point in 44°46'35.34" north latitude, 66°54'11.23" west longitude; thence due south to the parallel of 43°50' north latitude; thence due west to the Meridian of 67°40' west longitude; thence due south to the parallel of 42°20' north latitude; thence due east to a point in 66° west longitude; thence along a rhumb line in a southeasterly direction to a point in 42° north latitude 65°40' west longitude; thence due south to the parallel of 39° north latitude; thence due west to the Meridian of 71°40' west longitude; thence due north to a point three miles off the coast of the State of Rhode Island; thence along the coasts of Rhode Island, Massachusetts, New Hampshire, and Maine at a distance of three miles to the point of beginning.

(b) *Haddock.* The word "haddock" denotes any fish of the species Melanogrammus aeglefinus.

(c) *Haddock fishing.* The words "haddock fishing" mean and include (1) the catching, taking or fishing for or the attempted catching, taking or fishing for fish of the species Melanogrammus aeglefinus; and (2) the outfitting and departure of a vessel for or the return of a vessel from haddock fishing.

(d) *Fishing vessel.* The words "fishing vessel" denote every kind, type or description of watercraft or vessel subject to the jurisdiction of the United States used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(e) *Trawl net.* The words "trawl net" means any large bag net dragged in the sea by a vessel or vessels for the purpose of taking fish.

4016

(f) *Cod end.* The words "cod end" mean the bag-like extension attached to the after end of the belly of the trawl net and used to retain the catch.

§ 155.2 *Haddock registration certificates.* (a) No person shall engage in haddock fishing within the regulatory area nor shall any person possess, transport or deliver by means of any fishing vessel haddock taken within such area except under a haddock registration certificate issued and in force in conformity with the regulations in this part.

(b) The owner or operator of a fishing vessel may obtain without charge a haddock registration certificate by furnishing, on a form [1] to be supplied by the Fish and Wildlife Service, information specifying the names and addresses of the owner and operator of the vessel, the name, official number and home port of the vessel, and the period for which the haddock registration certificate is desired. The form shall be submitted, in duplicate, to the Regional Director, Fish and Wildlife Service, Department of the Interior, Boston, Massachusetts, who shall grant the registration certificate for the duration specified by the applicant in the form but in no event to extend beyond the end of the calendar year during which the registration certificate is issued. New registration certificates shall similarly be issued to replace expired, lost or mutilated certificates.

(c) The haddock registration certificate so issued by the Fish and Wildlife Service shall be carried on board the vessel for which it is issued at all times and such certificate, the vessel, its gear and equipment shall at all times be subject to inspection by officers authorized to enforce the regulations in this part.

§ 155.3 *Restrictions on fishing gear.* (a) No person shall possess at any time on board a vessel for which a haddock registration certificate is in force, or use or attempt to use from such vessel, a trawl net or nets, parts of nets or netting having a mesh size of less than four and one-half inches as defined in this section.

(b) As used in this section, the term "mesh size of less than four and one-half inches" shall mean (1) with respect to any part of the net except the cod end, the average size of any twenty consecutive meshes in any row located at least ten meshes from the side lacings measured when wet after use; and (2) with respect to the cod end, the average size of any row of meshes running the length of the cod end located at least ten meshes from the side lacings, measured when wet after use, or, at the option of the user, a cod end which has been approved, in accordance with paragraph (d) of this section, by an authorized representative of the Director of the Fish and Wildlife Service, as having a mesh size when dry before use equivalent to not less than four and one-half inches when wet after use.

(c) All measurements of meshes when wet after use shall be made by the insertion into such meshes under pressure of not less than ten nor more than fifteen pounds of a flat wedge-shaped gauge having a taper of two inches in nine inches and a thickness of three thirty-seconds of an inch.

(d) For the purpose of approving dry cod ends before use, as contemplated by paragraph (b) of this section, the average mesh size of such cod ends shall be determined by measuring the length of any single row of meshes running the length of the cod end, parallel to the long axis of the cod end and located at least ten meshes from the side lacings, when stretched under a tension of two hundred pounds, and dividing the length by the number of meshes in such row: *Provided*, That not more than ten percent of the meshes in such row shall be more than one-half inch smaller when measured between knot centers than the average of the row. Cod ends so measured which are constructed of the twines and are of not less than the average mesh sizes specified in the table below may be approved for haddock fishing by any authorized employee of the Fish and Wildlife Service by the attachment to such cod end of an appropriate seal or seals.

Twine	*Average mesh size*
4-ply 45-yard manila, double strand.	5.625 inches (5⅝").
4-ply 50-yard manila, double strand.	5.625 inches (5⅝").
4-ply 75-yard manila, double strand.	5.625 inches (5⅝").
4-ply 80-yard manila, double strand.	5.500 inches (5½").
120-thread cotton.	4.250 inches (4¼").

(e) The alteration, defacement of reuse of seals affixed to cod ends in accordance with this section is prohibited.

(f) The repair, alteration or other modification of cod ends to which seals have been affixed in accordance with this section shall invalidate such seals and such cod ends shall not thereafter be deemed to be approved for haddock fishing. Nothing contained in this section shall preclude the continued use at the option of the user, of cod ends having invalidated seals affixed thereto: *Provided*, That such cod ends after repair, alteration or other modification shall continue to have a mesh size of not less than four and one-half inches as defined in paragraph (b) of this section.

(g) The use in haddock fishing within the regulatory area of any device or method which will obstruct the meshes of the trawl net or which otherwise will have the effect of diminishing the size of said meshes is prohibited: *Provided*, That a protective covering may be attached to the underside only of the cod end alone of the net to reduce and prevent damage thereto.

§ 155.4 *Temporary suspension of haddock registration certificates.* (a) The owner or operator of any fishing vessel which is proposed to be used in haddock fishing beyond the limits of the regulatory area or is proposed to be used in

[1] Form filed as part of original document. Copies available upon request to Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.

fishing within such area for species of fish other than haddock, may obtain a temporary suspension of the haddock registration certificate issued for such vessel for the specified period during which such nonregulated fishing is to be conducted.

(b) Temporary suspension of haddock registration certificates shall be granted upon oral or written request, specifying the period of suspension desired, by an authorized officer of one of the following agencies: Fish and Wildlife Service, Coast Guard, Bureau of Customs, and Post Office Department. Such officer shall make appropriate endorsement on the certificate form evidencing the duration of its suspension.

§ 155.5 *Certain persons and vessels exempted.* Nothing contained in the regulations in this part shall apply to:

(a) Any person who or vessel which, in the course of taking fish other than haddock, takes and possesses a quantity of haddock not exceeding five thousand pounds, or ten percent of all fish on the vessel from which the fishing is conducted, whichever is the greater.

(b) Any person or vessel authorized by the Director of the Fish and Wildlife Service to engage in haddock fishing for scientific purposes.

(c) Any vessel documented as a common carrier by the Government of the United States and engaged exclusively in the carriage of freight and passengers.

Prior to the final adoption of the regulations set forth above, consideration will be given to any data, views or arguments relating thereto which are submitted in writing to the Director, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C., within the period of thirty days from the date of publication of this notice in the FEDERAL REGISTER.

Dated: June 6, 1956.

WESLEY A. D'EWART,
Assistant Secretary of the Interior.

* * * * *

HERRING QUOTA IN SOUTHEASTERN ALASKA INCREASED.

On the basis of herring abundance, it has been determined that the quota in Southeastern Alaska, in other than the Cape Ommaney-Cape Bingham section, can be increased from 17,500 short tons to 22,500 short tons. The Director of the U.S. Fish and Wildlife Service published this announcement in the Federal Register of July 20, 1956.

* * * * *

HIGH-SEAS FISHING FOR SALMON OFF ALASKA PROHIBITED:

In order to conserve the salmon runs of Alaska, fishing for salmon, except by trolling, on the high seas of the North Pacific Ocean and the Bearing Sea adjacent to Alaskan waters by any "person or fishing vessel subject to the jurisdiction of the United States," is prohibited by an order effective July 20, 1956.

This action is taken under authority of the North Pacific Fisheries Act of August 12, 1954. It is intended to prevent development of an American high seas salmon fishery which would intercept the Alaskan salmon runs before they reach waters now under regulation. It has been demonstrated that salmon can be taken in commercial quantities on the high seas to such an extent that protective measures imposed within Alaskan waters could be nullified. This made the new prohibition necessary.

The United States section of the International North Pacific Fisheries Commission (established by convention between the United States, Canada, and Japan for the conservation of the fisheries resources of the north Pacific Ocean) requested that this restrictive action be taken. It also has the endorsement of the canning operators and fishermen of Alaska.

The restriction applies only to waters adjacent to the waters of Alaska. The term "waters of Alaska" north and west of the international boundary at Dixon Entrance is defined as including those extending three miles seaward (1) from the coast, (2) from lines extending from headland to headland across all bays, inlets, straits, passes, sounds and entrances, and (3) from any island or groups of islands, including the islands of the Alexander Archipelago, and the waters between such groups of islands and the mainland.

The North Pacific Area, where fishing will be prohibited, is defined to include all waters of the north Pacific Ocean and Bearing Sea north of Dixon Entrance and east of 175 degrees west longitude, exclusive of the "waters of Alaska." This is the "abstention line" east of which the Japanese have agreed to abstain from fishing for salmon, herring, and halibut,

as provided for in the convention. Attention is called to the fact that this prohibition does not extend westward of the "abstention line."

The Department has long planned such action and notice of such intention had been filed. Subsequently information from Alaska revealed a serious threat of early establishment of the high-seas fishery which would jeopardize the Department's salmon conservation policy in the Bristol Bay area and further delay the salmon rehabilitation program which is so necessary to the welfare of Alaska.

Severe regulatory measures are in effect in Bristol Bay to arrest the decline and commence restoration of the runs that for years were three time their present size. These measures, among other things, restrict commercial fishing exclusively to gill nets, not more than 150 fathoms long, limit motor-propelled fishing boats to an over-all length of 32 feet, and limit the number of days fishing per week in accordance with the number of units of gear operating in each district.

With approximately half the number of units of gear operated in other recent years, and with only a four-week season, fishing is limited to two days per week in the Nushagak district, $2\frac{1}{2}$ days per week in the Egegik district, and three days per week in the Naknek-Kvichak and Ugashik districts. Further adjustments on fishing time are made weekly to meet changing conditions in the fishery and in the abundance of the runs.

The final regulation was signed by Secretary of the Interior Fred A. Seaton on July 19 and appeared in the Federal Register of July 20, 1956, as follows:

TITLE 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

Subchapter F—Alaska Commercial Fisheries

MISCELLANEOUS AMENDMENTS TO SUBCHAPTER

Basis and purpose. After consultation with the United States section of the International North Pacific Fisheries Commission, notice was published in the FEDERAL REGISTER on July 3, 1956 (21 F. R. 4932) of proposed rule making to prohibit salmon fishing, except trolling, by persons or vessels subject to the jurisdiction of the United States in certain waters adjacent to Alaska, and to redefine various fishing areas and districts. Subsequently, such fishing was prohibited in limited waters of Bering Sea by emergency regulation published in the FEDERAL REGISTER on July 7, 1956 (21 F. R. 5059), to avert the early establishment of a high seas fishery that would jeopardize the Bristol Bay salmon conservation program.

Accordingly, the following amendments and additions to 50 CFR Chapter I (Subchapter F, are effective immediately upon publication in the FEDERAL REGISTER. (60 Stat. 237; 5 U. S. C. 1001 et seq.)

PART 101—DEFINITIONS

A new section § 101.19 is added to read as follows:

§ 101.19 *Waters of Alaska.* As used in this subchapter, the term "waters of Alaska" includes those waters north and west of the International Boundary at Dixon Entrance extending three miles seaward (a) from the coast, (b) from lines extending from headland to headland across all bays, inlets, straits, passes, sounds and entrances, and (c) from any island or groups of islands, including the islands of the Alexander Archipelago, and the waters between such groups of islands and the mainland.

PART 103—KOTZEBUE-YUKON-KUSKOKWIM AREA

Section 103.1 is amended in text to read as follows:

§ 103.1 *Definition.* The Kotzebue-Yukon-Kuskokwim area includes all waters of Alaska between Point Hope and Cape Newenham.

PART 104—BRISTOL BAY AREA

Section 104.1 is amended in text to read as follows:

§ 104.1 *Definition.* The Bristol Bay area includes all waters of Alaska in Bristol Bay east of a line from Cape Newenham to a point 3 statute miles south of Cape Menshikof.

PART 105—ALASKA PENINSULA AREA

Section 105.1 is amended in text to read as follows:

§ 105.1 *Definition.* The Alaska Peninsula area includes all waters of Alaska from a point 3 statute miles south of Cape Menshikof to Unimak Pass, thence easterly to the western point at the entrance to Kuiukta Bay.

PART 106—ALEUTIAN ISLANDS AREA

Section 106.1 is amended in text to read as follows:

§ 106.1 *Definition.* The Aleutian Islands area includes all waters of Alaska in the Aleutian Islands west of, and including, Unimak Pass.

PART 109—COOK INLET AREA

Section 109.1 is amended in text to read as follows:

§ 109.1 *Definition.* The Cook Inlet area includes all waters of Alaska in Cook Inlet north of Cape Douglas and west of Point Gore, including the Barren Islands.

PART 110—RESURRECTION BAY AREA

Section 110.1 is amended in text to read as follows:

§ 110.1 *Definition.* The Resurrection Bay area includes all waters of Alaska in the Gulf of Alaska between Point Gore and Cape Fairfield.

PART 115—SOUTHEASTERN ALASKA AREA SALMON FISHERIES, GENERAL REGULATIONS

PART 116—SOUTHEASTERN ALASKA AREA FISHERIES OTHER THAN SALMON

PART 117—SOUTHEASTERN ALASKA AREA, ICY STRAIT DISTRICT, SALMON FISHERIES

PART 118—SOUTHEASTERN ALASKA AREA, WESTERN DISTRICT, SALMON FISHERIES

PART 119—SOUTHEASTERN ALASKA AREA, EASTERN DISTRICT, SALMON FISHERIES

PART 120—SOUTHEASTERN ALASKA AREA, STIKINE DISTRICT, SALMON FISHERIES

PART 121—SOUTHEASTERN ALASKA AREA, SUMNER STRAIT DISTRICT, SALMON FISHERIES

PART 122—SOUTHEASTERN ALASKA AREA, CLARENCE STRAIT DISTRICT, SALMON FISHERIES

PART 123—SOUTHEASTERN ALASKA AREA, SOUTH PRINCE OF WALES DISTRICT, SALMON FISHERIES

PART 124—SOUTHEASTERN ALASKA AREA, SOUTHERN DISTRICT, SALMON FISHERIES

1. Sections 115.1, 116.1, 117.1, 118.1, 119.1, 120.1, 121.1, 122.1, 123.1, and 124.1 are amended in text to read as follows:

The Southeastern Alaska area includes all waters of Alaska in Southeastern Alaska between Cape Fairweather and Dixon Entrance.

2. Sections 117.2, 118.2, 119.2, 121.2, 122.2, 123.2 and 124.2 are amended in text by deleting the words "territorial waters" and substituting in lieu thereof the words "waters of the area."

(Sec. 1, 43 Stat. 464, as amended, sec. 12, 68 Stat. 700; 48 U. S. C. 221, 16 U. S. C. 1031)

PART 130—NORTH PACIFIC AREA

The title to Part 130 is redesignated to read as set forth above and the revised part reads as follows:

Sec.
130.1 Definition, North Pacific area.
130.2 Salmon fishing prohibited, exception.

AUTHORITY: §§ 130.1 and 130.2 issued under sec. 1, 43 Stat. 464, as amended, sec. 12, 68 Stat. 700; 48 U. S. C. 221, 16 U. S. C. 1031.

§ 130.1 *Definition, North Pacific area.* The North Pacific area is defined to include all waters of the North Pacific Ocean and Bering Sea north of Dixon Entrance and east of 175 degrees west longitude, exclusive of the waters of Alaska as defined in Part 101 of this subchapter.

§ 130.2 *Salmon fishing prohibited, exception.* No person or fishing vessel subject to the jurisdiction of the United States shall fish for or take salmon, except by trolling, in the North Pacific area as defined in this part.

FRED A. SEATON,
Secretary of the Interior.

Salmon fishing except by trolling was first prohibited in limited waters of the Bering Sea by an emergency regulation published in the Federal Register of July 7, 1956, as follows:

TITLE 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

Subchapter F—Alaska Commercial Fisheries

PART 130—HIGH SEAS SALMON FISHERY

Basis and purpose. The red salmon runs of Bristol Bay, once the most important in the world, are seriously depleted, yielding only about one-third their former production. As a consequence, severe regulations have been imposed on the established fishery, greatly restricting the number of fishing boats and fishing time. These measures have been necessary to reserve a breeding population and prevent further depletion.

It has been determined that a fishery beyond the Territorial waters of Alaska and not subject to existing protective regulations, would nullify such conservation measures and cause irreparable damage to the already depleted red salmon runs to Bristol Bay. It was learned on July 3 that such high seas fishing was planned by certain operators, although there has been adequate notice at public hearings, in trade journals, and press notices that such fishing would be prohibited, and it was generally accepted by all segments of the Alaska fishing industry.

The United States Section of the International North Pacific Fisheries Commission has recommended that fishing for salmon on the high seas off the Alaska coast, except by trolling, be prohibited. Furthermore, the Chairman of the U. S. Section, by telephone July 4, urged emergency action to provide this protection to the Bristol Bay runs now.

Since an emergency has arisen and immediate action is necessary, further notice and public procedure on these regulations are impracticable and they shall become effective immediately upon publication in the FEDERAL REGISTER (60 Stat. 237; 54 U. S. C. 1001 et seq.).

A new part, designated Part 130, is added to read as follows:

§ 130.1 *Salmon fishing prohibited, exception.* No person or fishing vessel subject to the jurisdiction of the United States shall fish for or take salmon, except by trolling, on the high seas north of the Alaska Peninsula east of 162 degrees west longitude, including Bristol Bay.

(Sec. 12, 68 Stat. 700; 16 U. S. C. 1031)

FRED A. SEATON,
Secretary of the Interior.

JULY 5, 1956.

Notice of proposed rule making was published in the July 3, 1956 Federal Register as follows:

Fish and Wildlife Service

[50 CFR Parts 101, 103, 104, 105, 106, 109, 110, 115, 117, 130]

ALASKA COMMERCIAL FISHERIES

NOTICE OF PROPOSED RULE MAKING

Pursuant to Section 4 of the Administrative Procedure Act of June 11, 1946 (5 U. S. C. 1003) notice is hereby given that the Secretary of the Interior, under the authority of the act of June 18, 1926 (44 Stat. 752; 48 U. S. C. 221 et seq.), as amended, and the act of August 12, 1954 (68 Stat. 698; 48 U. S. C. 1021 et seq.), on the basis of successful exploratory net fishing for salmon native to Alaska on the high seas of the North Pacific Ocean, and after consultation with the United States section of the International North Pacific Fisheries Commission, proposes to:

1. Add the following section to Part 101:

§ 101.19 *Waters of Alaska.* For the purpose of this part, the term "waters of Alaska" north and west of the International Boundary at Dixon Entrance are defined as including those extending three miles seaward (a) from the coast, (b) from lines extending from headland to headland across all bays, inlets, straits, passes, sounds and entrances, and (c) from any island or groups of islands, including the islands of the Alexander Archipelago, and the waters between such groups of islands and the mainland.

2a. To amend § 103.1 so as to define the Kotzebue-Yukon-Kuskokwim area to include all waters of Alaska between Point Hope and Cape Newenham;

b. To amend § 104.1 so as to define the Bristol Bay area to include all waters of Alaska in Bristol Bay east of a line from Cape Newenham to a point 3 statute miles south of Cape Menshikof;

c. To amend § 105.1 so as to define the Alaska Peninsula area to include all waters of Alaska from a point 3 statute miles south of Cape Menshikof to Unimak Pass, thence easterly to the western point at the entrance to Kuiukta Bay;

d. To amend § 106.1 so as to define the Aleutian Islands area to include all waters of Alaska in the Aleutian Islands west of, and including, Unimak Pass;

e. To amend § 109.1 so as to define the Cook Inlet area to include all waters of Alaska in Cook Inlet north of Cape Douglas and west of Point Gore, including the Barren Islands;

f. To amend § 110.1 so as to define the Resurrection Bay area to include all waters of Alaska in the Gulf of Alaska between Point Gore and Cape Fairfield;

g. To amend §§ 115.1, 116.1, 117.1, 118.1, 119.1, 120.1, 121.1, 122.1, 123.1, and 124.1 so as to define the Southeastern Alaska area to include all waters of Alaska in Southeastern Alaska between Cape Fairweather and Dixon Entrance;

h. To amend §§ 117.2, 118.2, 119.2, 121.2, 122.2, 123.2, and 124.2 by deleting the words "territorial waters" and substituting in lieu thereof the words "waters of the area."

3. To add a new part reading as follows:

PART 130—NORTH PACIFIC AREA

§ 130.1 *Definition.* The North Pacific Area is defined to include all waters of the North Pacific Ocean and Bering Sea north of Dixon Entrance and east of 175 degrees west longitude, exclusive of the waters of Alaska as defined in Part 101 of this subchapter.

§ 130.2 *Salmon fishing prohibited, exception.* No person or fishing vessel sub-

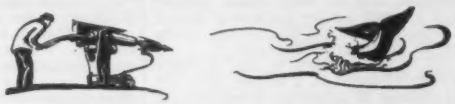
ject to the jurisdiction of the United States shall fish for or take salmon, except by trolling, in the North Pacific Area, as defined in this part.

Interested persons are invited to participate in the proposed rule making by submitting their views, data, or arguments in writing to the Director, Fish and Wildlife Service, Washington 25, D. C., within 15 days from the date of publication of this notice in the FEDERAL REGISTER.

WESLEY A. D'EWART,
Assistant Secretary of the Interior.

* * * * *

WHALING REGULATIONS REVISED: The whaling regulations as last amended have been edited to conform numbering, internal references, and similar items to regulations of the Administrative Committee of the Federal Register, but no changes have been made in the substantive provisions. The provisions of these regulations are applicable to nationals and whaling enterprises of the United States. The regulations as they were published in the June 27 issue of the Federal Register follow



TITLE 50—WILDLIFE

Chapter III—International Regulatory Agencies (Fishing and Whaling)

Subchapter B—International Whaling Commission

PART 351—WHALING

Basis and purpose. Section 13 of the Whaling Convention Act of 1949 (64 Stat. 421, 425; 16 U. S. C., 1952 ed., 916k), the legislation implementing the International Convention for the Regulation of Whaling signed at Washington December 2, 1946, by the United States of America and certain other Governments, provides that regulations of the International Whaling Commission shall be submitted for publication in the FEDERAL REGISTER by the Secretary of the Interior. Regulations of the Commission are defined to mean the whaling regulations in the schedule annexed to and constituting a part of the Convention in their original form or as modified, revised, or amended by the Commission. The provisions of the whaling regulations, as originally embodied in the schedule annexed to the Convention, have been amended several times by the International Whaling Commission, the last amendments having been made in July 1955. The whaling regulations, as last amended in July 1955, have been edited to conform the numbering, internal references, and similar items to regulations of the Administrative Committee of the Federal Register but no changes have been made in the substantive provisions. The provisions of these regulations are applicable to nationals and whaling enterprises of the United States.

Amendments to the whaling regulations are adopted by the International Whaling Commission pursuant to Article V of the Convention without regard to the notice and public procedure requirements of the Administrative Procedure Act (5 U. S. C. 1001). Accordingly, in fulfillment of the duty imposed upon the Secretary of the Interior by section 13 of the Whaling Convention Act of 1949, the whaling regulations published as Part 351, Title 50, Code of Federal Regulations, as the same appeared in 20 F. R. 5231, July 21, 1955, are amended and republished to read as follows:

Sec.

351.1 Inspection.
351.2 Killing of gray or right whales prohibited.
351.3 Killing of calves or suckling whales prohibited.
351.4 Operation of factory ships limited.
351.5 Closed area for factory ships in Antarctic.
351.6 Limitations on the taking of humpback whales.
351.7 Closed seasons for pelagic whaling for baleen and sperm whales.
351.8 Catch quota for baleen whales.
351.9 Minimum size limits.
351.10 Closed seasons for land stations.
351.11 Use of factory ships in waters other than south of 40° South Latitude.
351.12 Limitations on processing of whales.
351.13 Prompt processing required.
351.14 Remuneration of employees.
351.15 Submission of laws and regulations.
351.16 Submission of statistical data.
351.17 Factory ship operations within territorial waters.
351.18 Definitions.

AUTHORITY: §§ 351.1 to 351.18 issued under 64 Stat. 421–425; 16 U. S. C. 916–916l.

§ 351.1 *Inspection.* (a) There shall be maintained on each factory ship at least two inspectors of whaling for the purpose of maintaining twenty-four hour inspection. These inspectors shall be appointed and paid by the Government having jurisdiction over the factory ship.

(b) Adequate inspection shall be maintained at each land station. The inspectors serving at each land station shall be appointed and paid by the Government having jurisdiction over the land station.

§ 351.2 *Killing of gray or right whales prohibited.* It is forbidden to take or kill gray whales or right whales, except when the meat and products of such whales are to be used exclusively for local consumption by the aborigines.

§ 351.3 *Killing of calves or suckling whales prohibited.* It is forbidden to take or kill calves or suckling whales or female whales which are accompanied by calves or suckling whales.

§ 351.4 *Operation of factory ships limited.* (a) It is forbidden to kill or attempt to kill blue whales in the North Atlantic Ocean for a period of five years.[1]

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales in any of the following areas:

(1) In the waters north of 66° North Latitude except that from 150° East Longitude eastwards as far as 140° West Longitude the taking or killing of baleen whales by a factory ship or whale catcher shall be permitted between 66° North Latitude and 72° North Latitude;

(2) In the Atlantic Ocean and its dependent waters north of 40° South Latitude;

(3) In the Pacific Ocean and its dependent waters east of 150° West Longitude between 40° South Latitude and 35° North Latitude;

(4) In the Pacific Ocean and its dependent waters west of 150° West Longitude between 40° South Latitude and 20° North Latitude;

(5) In the Indian Ocean and its dependent waters north of 40° South Latitude.

§ 351.5 *Closed area for factory ships in Antarctic.* It is forbidden to use a whale catcher attached to a factory ship for the purposes of killing or attempting to kill baleen whales in the waters south of 40° South Latitude from 70° West Longitude westward as far as 160° West Longitude. (This article, as the result of the seventh meeting at Moscow, was rendered inoperative for a period of three years from November 8, 1955, after which it will automatically become operative again (November 8, 1958).)

§ 351.6 *Limitations on the taking of humpback whales.* (a) It is forbidden to kill or attempt to kill humpback whales in the North Atlantic Ocean for a period of five years.

(b) It is forbidden to kill or attempt to kill humpback whales in the waters south of 40° South Latitude between 0° Longitude and 70° West Longitude for a period of five years.

(c) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill humpback whales in any waters south of 40° South Latitude except on the 1st, 2d, 3d, and 4th February in any year.

§ 351.7 *Closed seasons for pelagic whaling for baleen and sperm whales.* (a) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales (excluding minke whales)

[1] This paragraph was objected to within the prescribed period ending November 7, 1954, by the Government of Iceland, and subsequently by that of Denmark. Neither objection was withdrawn and the paragraph came into force on February 24, 1955, but is not binding on Iceland and Denmark. It ceases to operate as from February 24, 1960.

in any waters south of 40° South Latitude, except during the period from January 7 to April 7, following, both days inclusive; and no such whale catcher shall be used for the purpose of killing or attempting to kill blue whales before the 1st February in any year.

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill sperm or minke whales, except as permitted by the Contracting Governments in accordance with paragraphs (c), (d) and (e) of this section.

(c) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction, one continuous open season not to exceed eight months out of any period of twelve months during which the taking or killing of sperm whales by whale catchers may be permitted; provided that a separate open season may be declared for each factory ship and the whale catchers attached thereto.

(d) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by the whale catchers may be permitted; provided that:

(1) A separate open season may be declared for each factory ship and the whale catchers attached thereto;

(2) The open season need not necessarily include the whole or any part of the period declared for other baleen whales pursuant to paragraph (a) of this section.

(e) Each Contracting Government shall declare for all whale catchers under its jurisdiction not operating in conjunction with a factory ship or land station one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by such whale catchers may be permitted.

§ 351.8 *Catch quota for baleen whales.* (a) The number of baleen whales taken during the open season caught in any waters south of 40° South Latitude by whale catchers attached to factory ships under the jurisdiction of the Contracting Governments shall not exceed fifteen thousand blue-whale units in the season 1955–56 and fourteen thousand five hundred blue-whale units thereafter.[2]

(b) For the purposes of paragraph (a) of this section, blue-whale units shall be calculated on the basis that one blue whale equals:

(1) Two fin whales or

(2) Two and a half humpback whales or

(3) Six sei whales.

(c) Notification shall be given in accordance with the provision of Article VII of the Convention, within two days after the end of each calendar week, of data on the number of blue-whale units taken in any waters south of 40° South Latitude by all whale catchers attached to factory ships under the jurisdiction of each Contracting Government: *Provided*, That when the number of blue-whale units is deemed by the Bureau of International Whaling Statistics to have reached 13,500 in the season 1955–56 and 13,000 thereafter,[2] notification shall be given as aforesaid at the end of each day of data on the number of blue-whale units taken.

(d) If it appears that the maximum catch of whales permitted by paragraph (a) of this section may be reached before April 7 of any year, the Bureau of International Whaling Statistics shall determine, on the basis of the data provided, the date on which the maximum catch of whales shall be deemed to have been reached and shall notify the master of each factory ship and each Contracting Government of that date not less than four days in advance thereof. The killing or attempting to kill baleen whales by whale catchers attached to factory ships shall be illegal in any waters south of 40° South Latitude after midnight of the date so determined.

(e) Notification shall be given in accordance with the provisions of Article VII of the Convention of each factory ship intending to engage in whaling operations in any waters south of 40° South Latitude.

§ 351.9 *Minimum size limits.* (a) It is forbidden to take or kill any blue, sei or humpback whales below the following lengths:

Blue whales 70 feet (21.3 metres),
Sei whales 40 feet (12.2 metres),
Humpback whales 35 feet (10.7 metres),

except that blue whales of not less than 65 feet (19.8 metres) and sei whales of not less than 35 feet (10.7 metres) in length may be taken for delivery to land stations, provided that the meat of such whales is to be used for local consumption as human or animal food.

(b) It is forbidden to take or kill any fin whales below 57 feet (17.4 metres) in length for delivery to factory ships or land stations in the Southern Hemisphere, and it is forbidden to take or kill fin whales below 55 feet (16.8 metres) for delivery to factory ships or land stations in the Northern Hemisphere; except that fin whales of not less than 55 feet (16.8 metres) may be taken for delivery to land stations in the Southern Hemisphere and fin whales of not less than 50 feet (15.2 metres) may be taken for delivery to land stations in the Northern Hemisphere provided in each case that the meat of such whales is to be used for local consumption as human or animal food.

(c) It is forbidden to take or kill any sperm whales below 38 feet (11.6 metres) in length, except that sperm whales of not less than 35 feet (10 7 metres) in length may be taken for delivery to land stations.

(d) Whales must be measured when at rest on deck or platform, as accurately as possible by means of a steel tape measure fitted at the zero end with a spiked handle which can be stuck into the deck planking abreast of one end of the whale. The tape measure shall be stretched in a straight line parallel with the whale's body and read abreast the other end of the whale. The ends of the whale, for measurement purposes, shall be the point of the upper jaw and the notch between the tail flukes. Measurements, after being accurately read on the tape measure, shall be logged to the nearest foot, that is to say, any whale between 75 feet 6 inches and 76 feet 6 inches shall be logged as 76 feet, and any whale between 76 feet 6 inches and 77 feet 6 inches shall be logged as 77 feet. The measurement of any whale which falls on an exact half foot shall be logged at the next half foot, e. g. 76 feet 6 inches precisely shall be logged as 77 feet.

§ 351.10 *Closed seasons for land stations.* (a) It is forbidden to use a whale catcher attached to a land station for the purpose of killing or attempting to kill baleen and sperm whales except as permitted by the Contracting Government in accordance with paragraphs (b), (c), and (d) of this section.

(b) Each Contracting Government shall declare for all land stations under its jurisdiction, and whale catchers attached to such land stations, one open season during which the taking or killing of baleen (excluding minke) whales by the whale catchers shall be permitted. Such open season shall be for a period of not more than six consecutive months in any period of twelve months and shall apply to all landstations under the jurisdiction of the Contracting Government; provided that a separate open season may be declared for any land station used for the taking or treating of baleen (excluding minke) whales which is more than 1,000 miles from the nearest land station used for the taking or treating of baleen (excluding minke) whales under the jurisdiction of the same Contracting Government.

(c) Each Contracting Government[1] shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations, one open season not to exceed eight continuous months in any one period of twelve months, during which the taking or killing of sperm whales by the whale catchers shall be permitted, such period of eight months to include the whole of the period of six months declared for baleen whales (excluding minke whales) as provided for in paragraph (b) of this section; provided that a separate open season may be declared for any land station used for the taking or treating of sperm whales which is more than 1,000 miles from the nearest land station used for the taking or treating of sperm whales under the jurisdiction of the same Contracting Government.

(d) (1) Each Contracting Government shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations one open season not to exceed six continuous months in any period of twelve months during which the taking or killing of minke whales by the whale catchers shall be permitted (such period not being necessarily concurrent with the period declared for other baleen whales, as provided for in paragraph (b) of this sec-

[2] The reduction for the season 1955–56 came into operation as from November 8, 1955, and the further reduction thereafter as from March 7, 1956, but the further reduction is not binding on the Governments of the Netherlands, the United Kingdom, Panama, South Africa, Norway, Japan, U. S. A. and Canada, who lodged objections within the prescribed period.

[1] Section 351.10 (c) came into force as from February 21, 1952, in respect to all Contracting Governments, except the Commonwealth of Australia, who lodged an objection to it within the prescribed period, and this objection was not withdrawn. The provisions of this paragraph are not therefore binding on the Commonwealth of Australia.

tion); provided that a separate open season may be declared for any land station used for the taking or treating of minke whales which is more than 1,000 miles from the nearest land station used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government.

(2) Except that a separate open season may be declared for any land station used for the taking or treating of minke whales which is located in an area having oceanographic conditions clearly distinguishable from those of the area in which are located the other land stations used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government; but the declaration of a separate open season by virtue of the provisions of this paragraph shall not cause thereby the period of time covering the open seasons declared by the same Contracting Government to exceed nine continuous months of any twelve months.

(e) The prohibitions contained in this section shall apply to all land stations as defined in Article II of the Whaling Convention of 1946 and to all factory ships which are subject to the regulations governing the operation of land stations under the provisions of § 351.17.

§ 351.11 *Use of factory ships in waters other than south of 40° South Latitude.* It is forbidden to use a factory ship which has been used during a season in any waters south of 40° South Latitude for the purpose of treating baleen whales, in any other area for the same purpose within a period of one year from termination of that season.

§ 351.12 *Limitations of processing of whales.* (a) It is forbidden to use a factory ship or a land station for the purpose of treating any whales (whether or not killed by whale catchers under the jurisdiction of a Contracting Government) the killing of which by whale catchers under the jurisdiction of a Contracting Government is prohibited by the provisions of §§ 351.2, 351.4, 351.5, 351.6, 351.7, 351.8 or 351.10.

(b) All other whales (except minke whales) taken shall be delivered to the factory ship or land station and all parts of such whales shall be processed by boiling or otherwise, except the internal organs, whale bone and flippers of all whales, the meat of sperm whales and of parts of whales intended for human food or feeding animals.

(c) Complete treatment of the carcasses of "Dauhval" and of whales used as fenders will not be required in cases where the meat or bone of such whales is in bad condition.

§ 351.13 *Prompt processing required.* (a) The taking of whales for delivery to a factory ship shall be so regulated or restricted by the master or person in charge of the factory ship that no whale carcass (except of a whale used as a fender, which shall be processed as soon as is reasonably practicable) shall remain in the sea for a longer period than thirty-three hours from the time of killing to the time when it is hauled up for treatment.

(b) Whales taken by all whale catchers, whether for factory ships or land stations, shall be clearly marked so as to identify the catcher and to indicate the order of catching.

(c) All whale catchers operating in conjunction with a factory ship shall report by radio to the factory ship:

(1) The time when each whale is taken,

(2) Its species, and

(3) Its marking effected pursuant to paragraph (b) of this section.

(d) The information reported by radio pursuant to paragraph (c) of this section shall be entered immediately in a permanent record which shall be available at all times for examination by the whaling inspectors; and in addition there shall be entered in such permanent record the following information as soon as it becomes available:

(1) Time of hauling up for treatment,

(2) Length, measured pursuant to paragraph (d) of § 351.9,

(3) Sex,

(4) If female, whether milk-filled or lactating,

(5) Length and sex of foetus, if present and

(6) A full explanation of each infraction.

(e) A record similar to that described in paragraph (d) of this section shall be maintained by land stations, and all of the information mentioned in the said paragraph shall be entered therein as soon as available.

§ 351.14 *Remuneration of employees.* Gunners and crews of factory ships, land stations, and whale catchers, shall be engaged on such terms that their remuneration shall depend to a considerable extent upon such factors as the species, size and yield of whales taken and not merely upon the number of the whales taken. No bonus or other remuneration shall be paid to the gunners or crews of whale catchers in respect to the taking of milk-filled or lactating whales.

§ 351.15 *Submission of laws and regulations.* Copies of all official laws and regulations relating to whales and whaling and changes in such laws and regulations shall be transmitted to the Commission.

§ 351.16 *Submission of statistical data.* Notification shall be given in accordance with the provisions of Article VII of the Convention with regard to all factory ships and land stations of statistical information (a) concerning the number of whales of each species taken, the number thereof lost, and the number treated at each factory ship or land station, and (b) as to the aggregate amounts of oil of each grade and quantities of meal, fertilizer (guano), and other products derived from them, together with (c) particulars with respect to each whale treated in the factory ship or land station as to the date and approximate latitude and longitude of taking, the species and sex of the whale, its length and, if it contains a foetus, the length and sex, if ascertainable, of the foetus. The data referred to in paragraphs (a) and (c) of this section shall be verified at the time of the tally and there shall also be notification to the Commission of any information which may be collected or obtained concerning the calving grounds and migration routes of whales. In communicating this information there shall be specified:

(a) The name and gross tonnage of each factory ship;

(b) The number and aggregate gross tonnage of the whale catchers;

(c) A list of the land stations which were in operation during the period concerned.

§ 351.17 *Factory ship operations within territorial waters.*[4] (a) A factory ship which operates solely within territorial waters in one of the areas specified in paragraph (c) of this section, by permission of the Government having jurisdiction over those waters, and which flies the flag of that Government shall, while so operating, be subject to the regulations governing the operation of land stations and not to the regulations governing the operation of factory ships.

(b) Such factory ship shall not, within a period of one year from the termination of the season in which she so operated, be used for the purpose of treating baleen whales in any of the other areas specified in paragraph (c) of this section or south of 40° South Latitude.

(c) The areas refered to in paragraphs (a) and (b) of this section are:

(1) On the coast of Madagascar and its dependencies;

(2) On the west coasts of French Africa;

(3) On the coasts of Australia, namely on the whole east coast and on the west coast in the area known as Shark Bay and northward to North-west Cape and including Exmouth Gulf and King George's Sound, including the Port of Albany.

§ 351.18 *Definitions.* The following expressions have the meanings respectively assigned to them, that is to say:

"Baleen whale" means any whale which has baleen or whale bone in the mouth, i. e., any whale other than a toothed whale.

"Blue whale" (Balaenoptera or Sibbaldus musculus) means any whale known by the name of blue whale, Sibbald's rorqual, or sulphur bottom.

"Dauhval" means any unclaimed dead whale found floating.

"Fin whale" (Balaenoptera physalus) means any whale known by the name of common finback, common rorqual, finback, finner, fin whale, herring whale, razorback or true fin whale.

"Gray whale" (Rhachianectes glaucus) means any whale known by the name of gray whale, California gray, devil fish, hard head, mussel digger, gray back or rip sack.

"Humpback whale" (Megaptera nodosa or novaeangliae) means any whale known by the name of bunch, humpback,

[4] Section 351.17 was inserted by the Commission at its first meeting in 1949, and came into force on 11th January, 1950, as regards all Contracting Governments except France, who therefore remain bound by the provisions of the original § 351.17, which reads as follows:

§ 351.17 Notwithstanding the definition of land station contained in Article II of the Convention, a factory ship operating under the jurisdiction of a Contracting Government, and the movements of which are confined solely to the territorial waters of that Government, shall be subject to the regulations governing the operation of land stations within the following areas:

(a) On the coast of Madagascar and its dependencies, and on the west coasts of French Africa;

(b) On the west coast of Australia in the area known as Shark Bay and northward to Northwest Cape and including Exmouth Gulf and King George's Sound, including the port of Albany; and on the east coast of Australia, in Twofold Bay and Jervis Bay.

humpback whale, humpbacked whale, hump whale or hunchbacked whale.

"Minke whale" (Balaenoptera acutorostrata, B. Davidsoni, B. huttoni) means any whale known by the name of lesser rorqual, little piked whale, minke whale, pike-headed whale or sharp headed finner.

"Right whale" (Balaena mysticetus; Eubalaena glacialis, E. australis, etc; Neobalaena marginata) means any whale known by the name of Atlantic right whale, Artic right whale, Biscayan right whale, bowhead, great polar whale, Greenland right whale, Greenland whale, Nordkaper, North Atlantic right whale, North Cape whale, Pacific right whale, pigmy right whale, Southern pigmy right whale, or Southern right whale.

"Sei whale" (Balaenoptera borealis) means any whale known by the name of sei whale, Rudolphi's rorqual, pollack whale, or coalfish whale and shall be taken to include Bryde's whale (B. brydei).

"Sperm whale" (Physeter catodon) means any whale known by the name of sperm whale, spermacet whale, cachalot or pot whale.

"Toothed whale" means any whale which has teeth in the jaws.

"Whales taken" means whales that have been killed and either flagged or made fast to catchers.

FRED A. SEATON,
Secretary of the Interior.

JUNE 20, 1956.

Eighty-Fourth Congress (Second Session)

Listed below and on the following pages are public bills and resolutions that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown when introduced; from month to month the more pertinent reports, hearings, or chamber actions on the bills shown are published; and if passed, they are shown when signed by the President.

COMMERCIAL FISHERIES EDUCATIONAL PROGRAM: H. R. 10433 (McCormack), a bill to promote the fishing industry in the United States and its Territories by providing for the training of needed personnel for such industry, removed from the consent calendar of the House on July 16, 1956. This bill is similar to S. 2379 (Payne). House on July 21, 1956, adopted H. Res. 612, the rule providing for the consideration of, and one hour of debate on, H. R. 10433, but did not consider the bill.

House after it amended S. 2379 to contain the text of H. R. 10433, a similar bill passed S. 2379.

Senate on July 27 cleared for the President S. 2379 when it concurred in House amendments to the bill.

S. 2379 signed by the President on August 8, 1956 (P. L. 1027).

CUSTOMS SIMPLIFICATION ACT: H. R. 6040 (amended), a bill to amend certain administrative provisions of the Tariff Act of 1930 and to repeal obsolete provisions of the customs laws, reported favorably on July 9, 1956, by the Senate Committee on Finance. (This bill was introduced in the first session of the 84th Congress and was reported favorably to the House on June 18, 1955, H. Rept. 858.) Reported with amendments to the Senate by the Committee on Finance on July 13 (S. Rept. No. 2560).

Conferees agreed to file a report (July 21, 1956) on the differences between the Senate- and House-passed versions.

Senate adopted the conference report on July 25, 1956, and and cleared the bill for the President.

Senate Report No. 2560, Customs Simplification Act of 1956 (July 13, 1956, 84th Congress, 2nd Session), to accompany H. R. 6040, 28 pp., printed. Committee on Finance. Describes the amendments; purpose of the bill; general statement; changes in existing law; and presents minority views.

FISH AND WILDLIFE ACT OF 1956 (Previously referred to as "Commercial Fisheries National Policy and Undersecretary for Fisheries and Wildlife"; "Commercial Fisheries National Policy and Assistant Secretary for Fisheries and Wildlife"; also "Commercial Fisheries National Policy and Fisheries Commission"; and by other titles):

On July 7 after adopting an amendment that replaced the Senate-passed text with the provisions of H. R. 11570 (Bonner), the House passed on that date S. 3275, a bill to establish a sound and comprehensive national policy with respect to fisheries and wildlife; to strengthen the fisheries and wildlife segments of the national ecomony; to create and establish within the Department of the Interior the Office of Assistant Secretary for Fisheries and Wildlife, a United States Fish and Wildlife Service; and for other purposes.

Senate disagreed to House amendments to S. 3275, to establish a sound and comprehensive national policy with regard to fisheries resources and asked for a conference with the House, and appointed conferees. S. 3275 contains the text of H. R. 11570 (Bonner) which passed the House on July 7.

House and Senate conferees met in executive session to resolve differences between the Senate- and House-passed versions of S. 3275.

On July 26 conferees in executive session agreed to file a conference report on the differences between the Senate- and House-passed versions of S. 3275.

Conference report on S. 3275 (H. Rept. 2942) was reported to the House on July 26. House on that date adopted the conference report on S. 3275 and sent the bill to the Senate.

Following the adoption by the House of the conference report on S. 3275, the Senate passed the bill on July 27, 1956, and the bill was cleared for the President. The bill as finally passed provides, among other provisions, for the following:

Sec. 3. (a) There is hereby established within the Department of the Interior the position of Assistant Secretary

for Fish and Wildlife, and the position of Commissioner of Fish and Wildlife. Such Assistant Secretary shall be appointed by the President, by and with the advice and consent of the Senate, and shall be compensated at the same rate as other Assistant Secretaries. The Commissioner shall be appointed by the President by and with the advice and consent of the Senate. He shall receive compensation at the same rate as that provided for Grade GS-18. There is also established a United States Fish and Wildlife Service within the Department, consisting of two separate agencies, each of which shall have the status of a Federal bureau. There shall be a Director of each of said Bureaus appointed by the Secretary at Grades GS-17 each. One of the agencies shall be known as the "Bureau of Commercial Fisheries" and the other agency shall be known as the "Bureau of Sport Fisheries and Wildlife." The United States Fish and Wildlife Service, except as prescribed by this Act, shall succeed to and replace the presently existing Fish and Wildlife Service of the Department. ...

(d) In order to make a proper distribution between the two Bureaus of the United States Fish and Wildlife Service established by this Act, the previously existing functions, powers, duties, authority, liabilities, commitments, personnel, records, and other properties or matters previously handled by or administered through the former Fish and Wildlife Service of the Department, shall be distributed as follows:

(1) The Bureau of Commercial Fisheries shall be responsible for those matters to which this Act applies relating primarily to commercial fisheries, whales, seals, sea-lions, and related matters;

(2) The Bureau of Sport Fisheries and Wildlife shall be responsible for those matters to which this Act applies relating primarily to migratory birds, game management, wildlife, refuges, sport fisheries, sea mammals (except whales, seals, and sea-lions), and related matters; and the funds and allocations, appropriated or otherwise, relating to the matters covered by paragraphs (1) and (2) of this subsection shall be distributed between such Bureaus as the Secretary of the Interior shall determine. ...

Sec. 4. (a) The Secretary is authorized under rules and regulations and under terms and conditions prescribed by him, to make loans for financing and refinancing of operations, maintenance, replacement, repair, and equipment of fishing gear and vessels, and for research into the basic problems of fisheries.

(b) Any loans made under the provisions of this section shall be subject to the following restrictions:

(1) Bear an interest rate of not less than 3 per centum per annum;

(2) Mature in not more than ten years;

(3) No financial assistance shall be extended pursuant to this section unless reasonable financial assistance applied for is not otherwise available on reasonable terms.

(c) There is hereby created a fisheries loan fund, which shall be used by the Secretary as a revolving fund to make loans for financing and refinancing under this section. Any funds received by the Secretary on or before June 30, 1965, in payment of principal or interest on any loans so made, shall be deposited in the fund and be available for making additional loans under this section. Any funds so received after June 30, 1965, and any balance remaining in the fund at the close of June 30, 1965 (at which time the fund shall cease to exist), shall be covered into the Treasury as miscellaneous receipts. There are hereby authorized to be appropriated to the fund the sum of $10,000,000 to provide initial capital.

(d) The Secretary, subject to the specific limitations in this section, may consent to the modification, with respect to the rate of interest, time of payment of any installment of principal, or security, of any loan contract to which he is a party.

S. 3275 was signed by the President on August 8, 1956 (P. L. 1024).

House Report No. 2942, Fish and Wildlife Act of 1956 (July 26, 1956, 84th Congress, 2nd Session), conference report to accompany S. 3275, 9 pp., printed. Committee of Conference. Shows the agreed version of the bill and the statement of the managers on the part of the House.

FISH HATCHERIES: Senate on July 2 passed without amendment and cleared for the House S. 3998, providing for the development of Federal fish hatchery known as Holden Trout Hatchery at Pittsford, Vt. Reported favorably on July 13 to the House by the House Committee on Merchant Marine and Fisheries. Passed by House on July 23 and cleared for the President.

H. R. 11548 (Poff), a bill to establish a new fish hatchery in the vicinity of Paint Bank, Va., reported favorably to the House by the Committee on Merchant Marine and Fisheries, July 13. Passed the House without amendment on July 23. Reported to the Senate on July 25 by the Committee on Interstate and Foreign Commerce (S. Rept. 2806). Senate passed without amendment and cleared for the President H. R. 11548.

H. R. 12303 (Staggers), introduced in the House July 11, a bill to provide for the establishment of a fish hatchery in West Virginia; to the Committee on Merchant Marine and Fisheries. Reported without amendment on July 21, 1956, by the Committee on Merchant Marine and Fisheries (H. Rept. 2858). House on July 26 passed and cleared for the President S. 3831 (in lieu of H. R. 12303), to provide for the establishment of a fish hatchery in West Virginia.

H. R. 221, a bill to establish rearing ponds and a fish hatchery in western Oklahoma; passed over without prejudice by the House on July 16, 1956.

House Report No. 2269, Establishing Rearing Ponds and a Fish Hatchery in Western Oklahoma, Texas, Colorado, or Kansas (June 7, 1956, 84th Congress, 2nd Session), to accompany H. R. 221; 3 pp., printed. Lists amendments, discusses purpose, and presents reports of the Department of the Interior and the Bureau of the Budget.

S. 3809 (Carlson), a bill to provide for the establishment of a new fish hatchery at Cedar Bluff Reservoir; Senate reported on July 20, 1956, with an amendment by the Committee on Interstate and Foreign Commerce (S. Rept. 2672). Similar to H. R. 11012 (Smith of Kansas). Passed the Senate on July 23 with an amendment and cleared for the House.

INSECTICIDES EFFECT UPON FISH AND WILDLIFE: S. 4178 (Murray) introduced in the Senate July 6; a bill to authorize and direct the Secretary of the Interior to undertake continuing studies of the effects of insecticides, herbicides, and fungicides upon fish and wildlife for the purpose of preventing losses of those invaluable natural resources

following spraying, and to provide basic data on the various chemical controls so that forests, croplands, and marshes can be sprayed with minimum losses of fish and wildlife; to the Committee on Merchant Marine Fisheries.

SPONGE DIVERS: H. R. 12022 (Cramer) introduced in the House June 28, 1956; a bill to provide relief for the sponge-fishing industry by a making special non quota immigrant visas available to certain skilled alien sponge divers; to the Committee on the Judiciary.

SUPPLEMENTARY APPROPRIATIONS: H. R. 12138, a bill making supplemental appropriations for fiscal year 1957; Senate adopted conference report on July 25 and cleared the bill for the President. This bill provides $620,000 for the Great Lakes Fisheries Commission.

H. R. 12350, a bill making supplemental appropriations for the fiscal year 1957, reached the Senate floor on July 25; certain Committee amendments were adopted en bloc, and the bill was passed. The bill provides for supplemental appropriations for the U. S. Fish and Wildlife Service including an additional amount of $1,250,000 for construction to be available until expended, and initial capital of $10,000,000 for the "Fisheries Loan Fund," a revolving fund for financing and refinancing of operations, maintenance, replacement, repair, and equipment of fishing gear and vessels and for research into the basic problems of fisheries. Conferees on July 26 agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 12350. Senate on July 26 rejected conference report on H. R. 12350. Senate then further insisted on its amendments in disagreement, asked for an additional conference, and reappointed the same conferees. Conference report on H. R. 12350 (H. Rept. 2941) was reported to the House on July 26. House on July 26 disagreed to Senate amendments to H. R. 12350; agreed to a conference with the Senate; and appointed conferees. On the same date House adopted the conference report on H. R. 12350, and sent the bill to the Senate. House on July 27 adopted H. Res. 648, providing for further insistence of House disagreement to Senate amendments to H. R. 12350; agreed to a further conference with the Senate, and the appointment of conferees. House conferees reported to House on July 27 conference report on H. R. 12350 (H. Rept. 2950). Adopted conference report and sent bill to Senate. Senate adopted conference report on H. R. 12350, agreeing to House amendments to amend certain Senate amendments and cleared the bill for the President.

Senate Report No. 2770, Second Supplemental Appropriation Bill, 1957 (July 24, 1956, 84th Congress, 2nd Session) to accompany H. R. 12350, 35 pp., printed. Committee on appropriations. Contains details on the appropriations and a comparative statement of budget estimates and amounts recommended in the bill.

House Report No. 2941, Second Supplemental Appropriation Bill, 1957 (July 26, 1956, 84th Congress, 2nd Session) to accompany H. R. 12350, 8 pp., printed. Committee of Conference. Describes agreement and presents the statement of the managers on the part of the House.

TRUCK TRIP LEASING: House on July 13 adopted committee amendments, passed, and returned to the Senate S. 898, to amend the Interstate Commerce Act with respect to the authority of the Interstate Commerce Commission to regulate the use by motor carriers of motor vehicles not owned by them.

Senate adopted conference report on July 25, 1956, and cleared the bill for the President.

The passage of this bill prohibits the I.C.C. from restricting the use of exempt trucks. The bill fully protects the exempt truckers. The effect of the bill is to permit: (1) exempt truckers to "trip lease" their trucks to common carriers for payloads back to fish producing areas of their base of operations; and (2) private carriers (shippers) to "trip lease" their trucks which are used to haul perishable manufactured fishery, agricultural, or livestock products.

WATER POLLUTION: S. 890, a bill to extend and strengthen the Water Pollution Control Act. House adopted conference report and cleared the bill for the White House on June 27, 1956. Signed by the President on July 9, 1956 (P. L. 667).

The water pollution control law extension bill provides for the Federal Government to subsidize the building of state or municipal treatment facilities. Present law authorizes loans up to $22.5 million a year but no funds have ever been dispensed under the provision. The new bill makes $50 million available a year over a ten year period in grants for construction of local facilities. Another $3 million a year in grants may be made for pollution-control planning and program work.

PACIFIC COAST AND ALASKA FISHERIES, Senate Report No. 2801 (Report of the Committee on Interstate and Foreign Commerce pursuant to S. Res. 13 and S. Res. 163, 84th Congress, 2nd Session, providing for the investigation of certain problems within the jurisdiction of the Senate Committee on Interstate and Foreign Commerce), submitted to the Senate July 25, 40 pp., printed. This report of conditions affecting commercial fisheries on the Pacific Coast and Alaska discusses Alaska salmon and related fisheries, the tuna fishing industry, and secondary effects of the fishing industry depression. Included are conclusions and recommendations regarding the creation of a new Government authority; conservation and development; regulation of competitive imports; and economic aid. An addendum lists recent fisheries legislation and appendixes show the correspondence between the Committee Chairman and the Department of State and the U. S. Tariff Commission.

INTERIOR DEPARTMENT AND RELATED AGENCIES APPROPRIATIONS FOR 1957 (Hearings before the Subcommittee of the Committee on Appropriations House of Representatives, Eighty-Fourth Congress, Second Session), 1,002 pp., printed.

Both the House and Senate adjourned sine die on July 27, 1956.

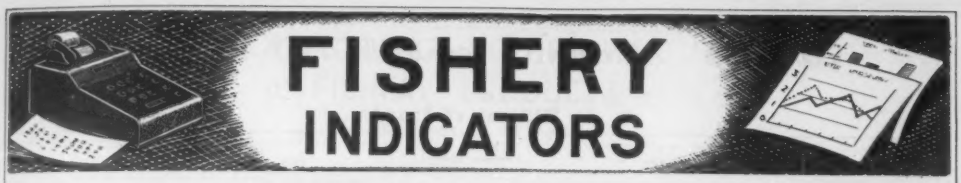
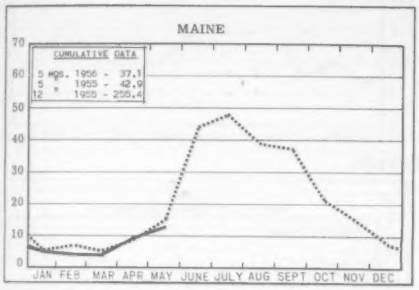
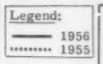
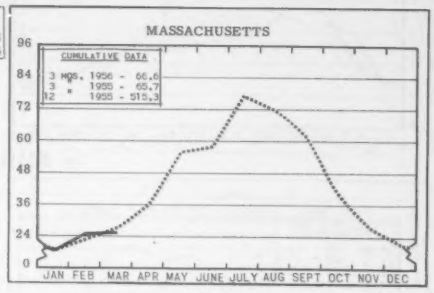


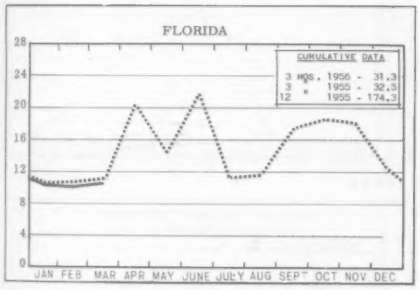
CHART I - FISHERY LANDINGS for SELECTED STATES

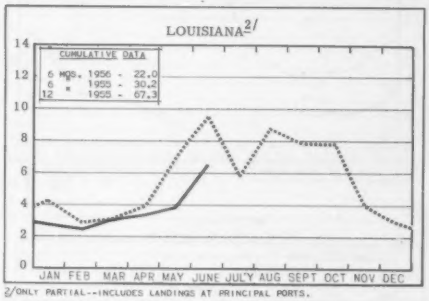
In Millions of Pounds



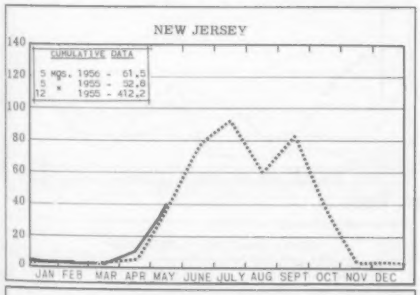


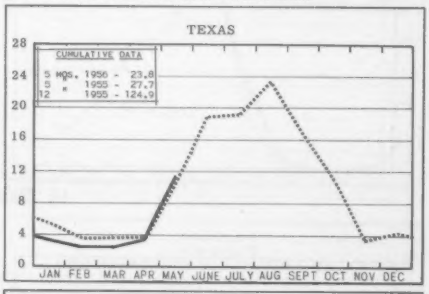


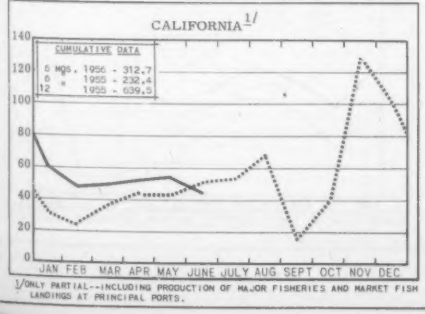




2/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.







1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

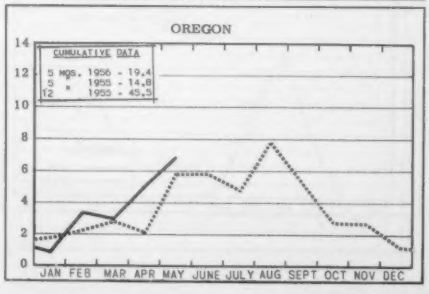
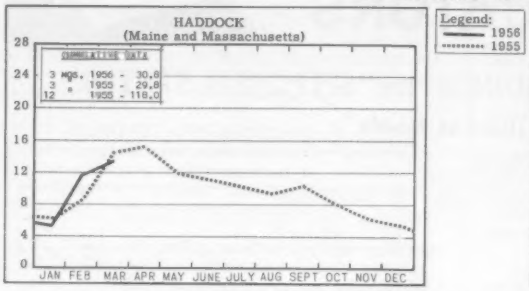
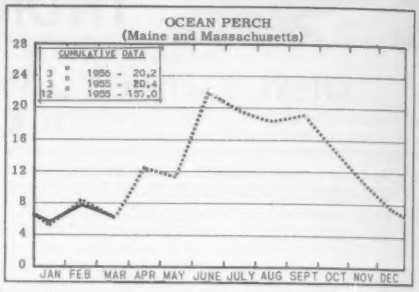


CHART 2 - LANDINGS for SELECTED FISHERIES

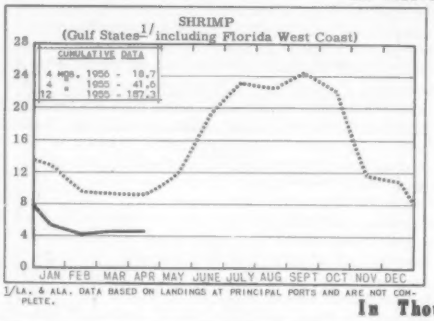
In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
3 MOS. 1956 - 30.8
3 " 1955 - 29.8
12 " 1955 - 118.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

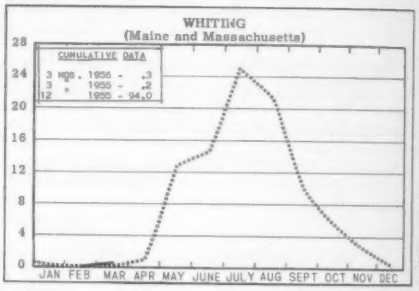
Legend:
1956
1955


OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
3 " 1956 - 20.2
3 " 1955 - 20.4
12 " 1955 - 157.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

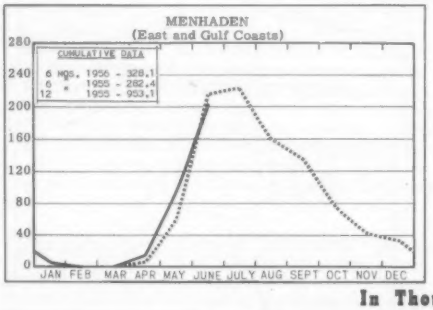
In Millions of Pounds

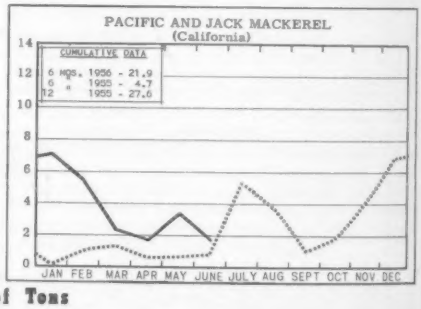

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
4 MOS. 1956 - 18.7
4 " 1955 - 41.6
12 " 1955 - 187.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

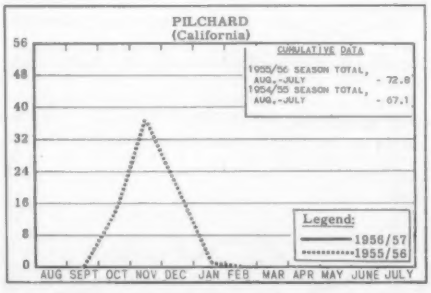

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
3 MOS. 1956 - .3
3 " 1955 - .2
12 " 1955 - 94.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

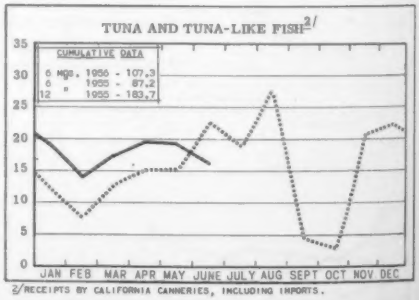
In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
6 MOS. 1956 - 328.1
6 " 1955 - 282.4
12 " 1955 - 953.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
6 MOS. 1956 - 21.9
6 " 1955 - 4.7
12 " 1955 - 27.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons

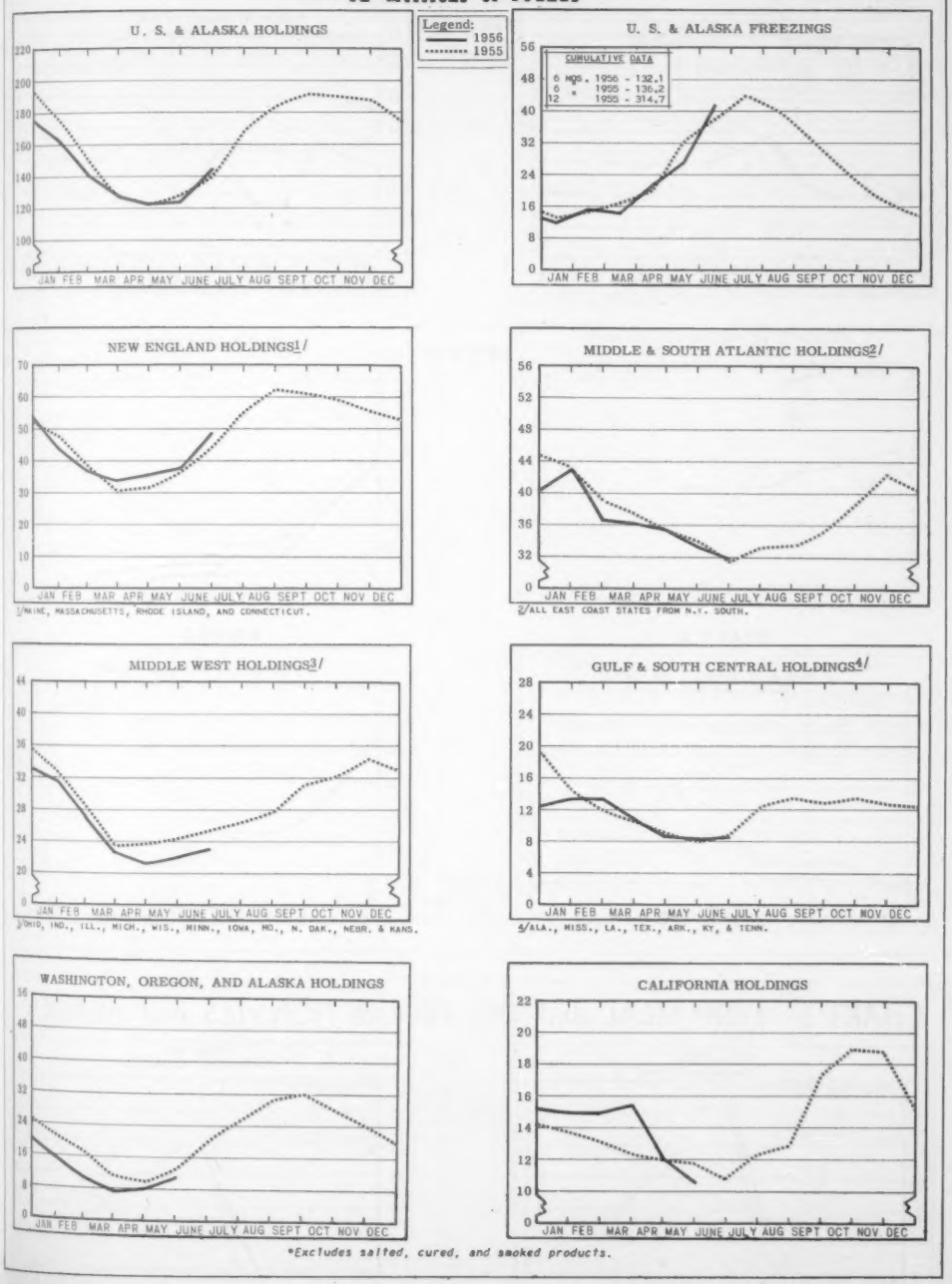



TUNA AND TUNA-LIKE FISH 2/
CUMULATIVE DATA
6 MOS. 1956 - 107.3
6 " 1955 - 87.2
12 " 1955 - 183.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
Legend:
1956
1955
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
6 MOS. 1956 - 132.1
6 " 1955 - 136.2
12 " 1955 - 314.7
NEW ENGLAND HOLDINGS1/
MIDDLE & SOUTH ATLANTIC HOLDINGS2/
MIDDLE WEST HOLDINGS3/
GULF & SOUTH CENTRAL HOLDINGS4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

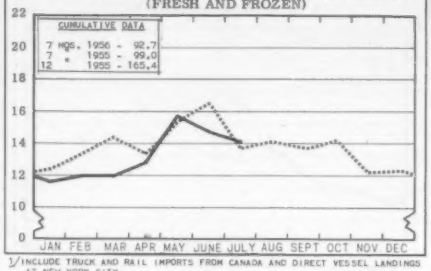
*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

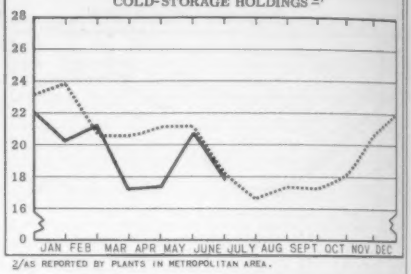
NEW YORK CITY

RECEIPTS[1/] AT WHOLESALE SALT-WATER MARKET (FRESH AND FROZEN)



1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

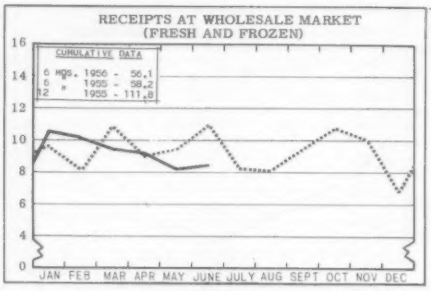
COLD-STORAGE HOLDINGS [2/]



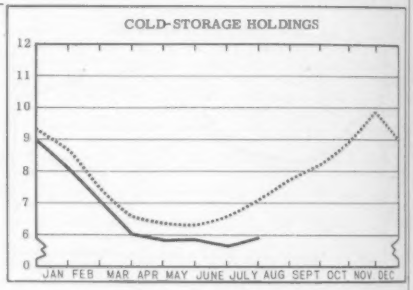
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHICAGO

RECEIPTS AT WHOLESALE MARKET (FRESH AND FROZEN)

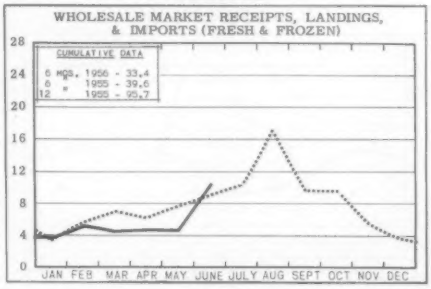


COLD-STORAGE HOLDINGS



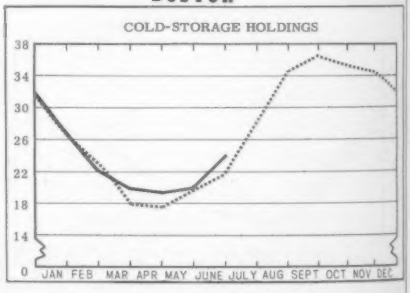
SEATTLE

WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN)



BOSTON

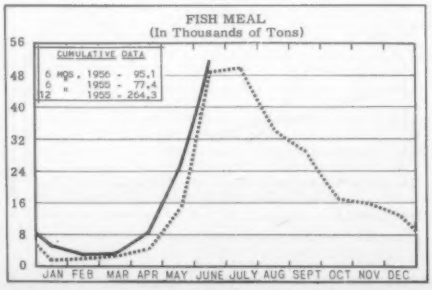
COLD-STORAGE HOLDINGS



Legend:
1956
1955

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

FISH MEAL
(In Thousands of Tons)



FISH OIL
(In Millions of Gallons)

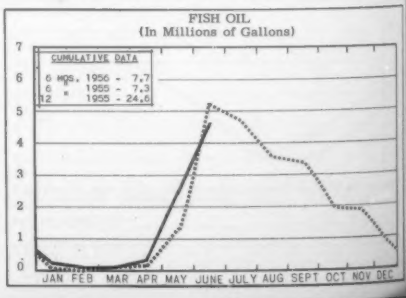
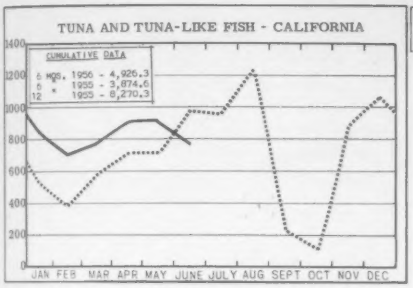
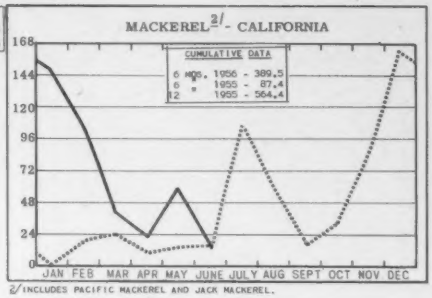


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

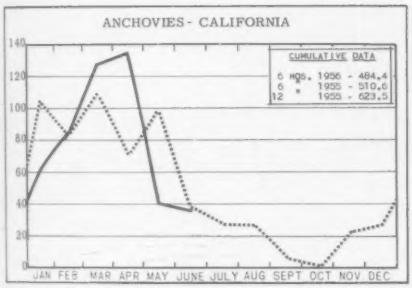
In Thousands of Standard Cases

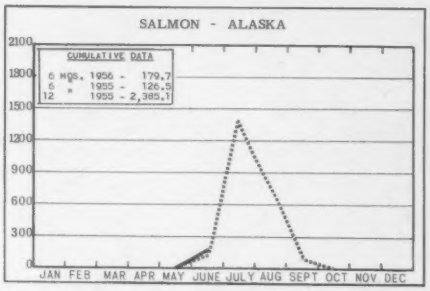

TUNA AND TUNA-LIKE FISH - CALIFORNIA
CUMULATIVE DATA
6 MOS. 1956 - 4,926.3
6 " 1955 - 3,874.6
12 " 1955 - 8,270.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

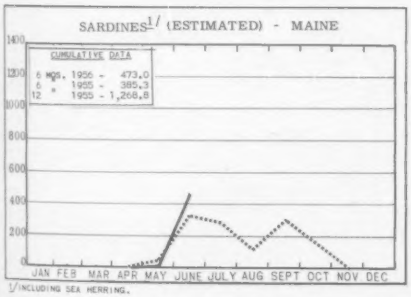
Legend:
1956
1955


MACKEREL 2/ - CALIFORNIA
CUMULATIVE DATA
6 MOS. 1956 - 389.5
6 " 1955 - 87.4
12 " 1955 - 564.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.


ANCHOVIES - CALIFORNIA
CUMULATIVE DATA
6 MOS. 1956 - 484.4
6 " 1955 - 510.6
12 " 1955 - 623.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

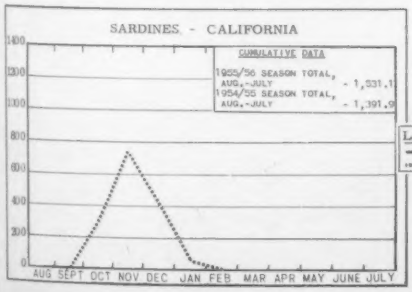



SARDINES 1/ (ESTIMATED) - MAINE
CUMULATIVE DATA
6 MOS. 1956 - 473.0
6 " 1955 - 385.3
12 " 1955 - 1,268.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¼ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1955/56 SEASON TOTAL, AUG.-JULY - 1,531.1
1954/55 SEASON TOTAL, AUG.-JULY - 1,391.9
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

Legend:
1956/57
1955/56

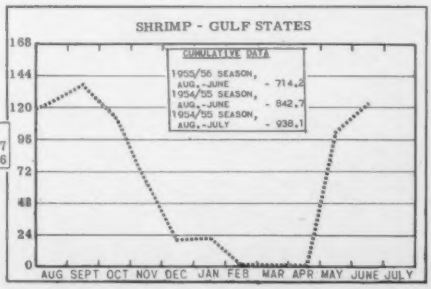
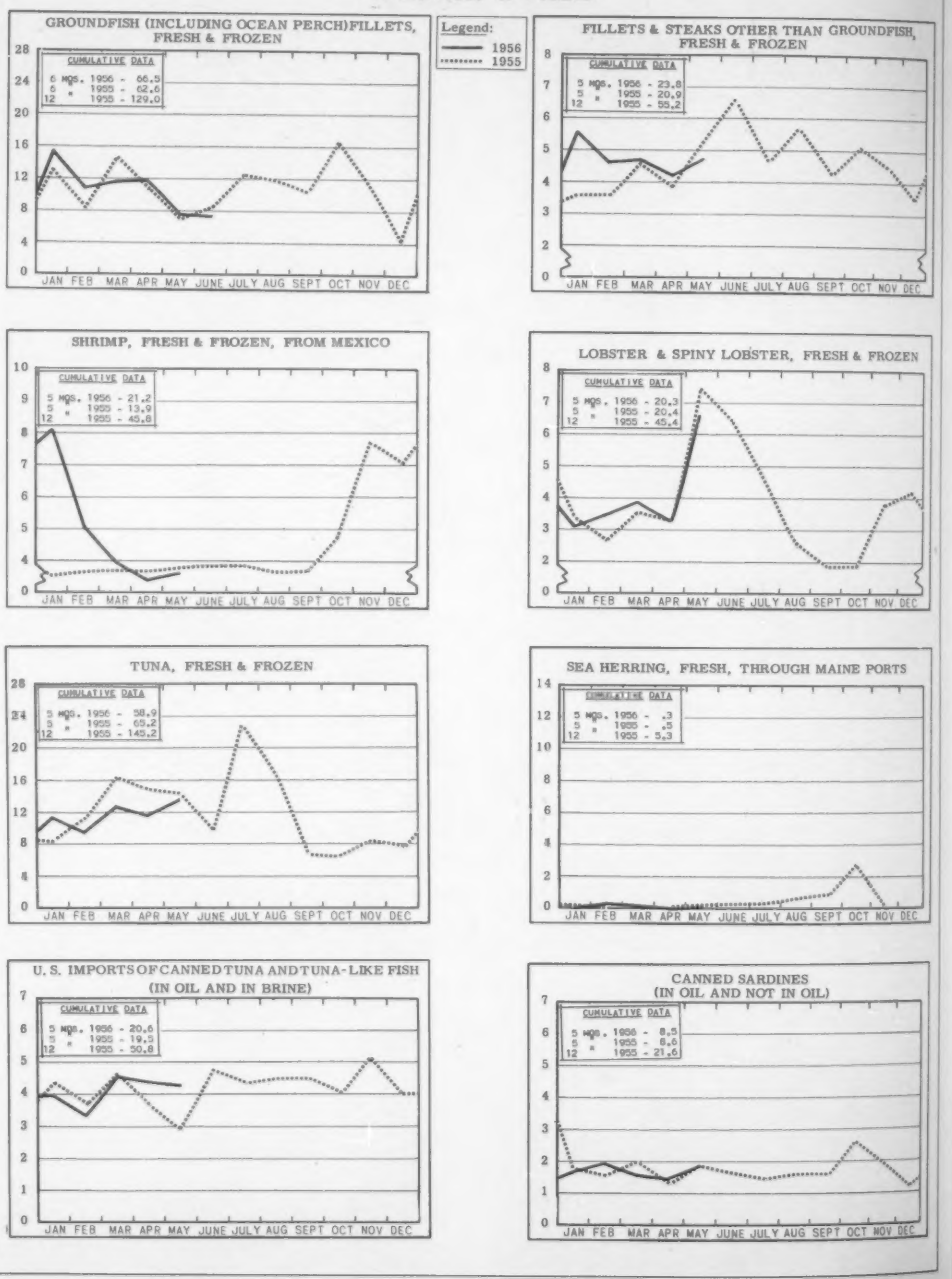
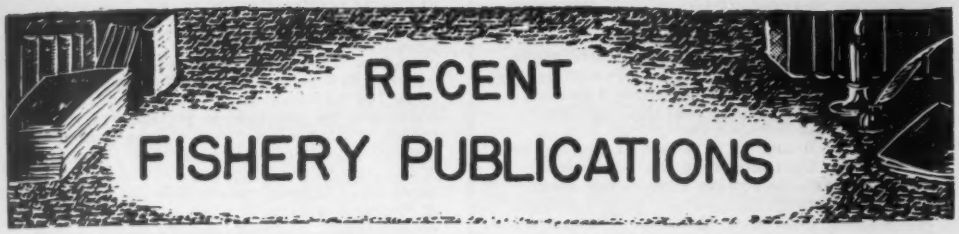

SHRIMP - GULF STATES
CUMULATIVE DATA
1955/56 SEASON, AUG.-JUNE - 714.2
1954/55 SEASON, AUG.-JUNE - 842.7
1954/55 SEASON, AUG.-JULY - 938.1
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (INCLUDING OCEAN PERCH) FILLETS, FRESH & FROZEN
CUMULATIVE DATA
5 MOS. 1956 - 66.5
5 " 1955 - 62.6
12 " 1955 - 129.0
Legend:
1956
1955
FILLETS & STEAKS OTHER THAN GROUNDFISH, FRESH & FROZEN
CUMULATIVE DATA
5 MOS. 1956 - 23.8
5 " 1955 - 20.9
12 " 1955 - 55.2
SHRIMP, FRESH & FROZEN, FROM MEXICO
CUMULATIVE DATA
5 MOS. 1956 - 21.2
5 " 1955 - 13.9
12 " 1955 - 45.8
LOBSTER & SPINY LOBSTER, FRESH & FROZEN
CUMULATIVE DATA
5 MOS. 1956 - 20.3
5 " 1955 - 20.4
12 " 1955 - 45.4
TUNA, FRESH & FROZEN
CUMULATIVE DATA
5 MOS. 1956 - 58.9
5 " 1955 - 65.2
12 " 1955 - 145.2
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
5 MOS. 1956 - .3
5 " 1955 - .5
12 " 1955 - 3.3
U. S. IMPORTS OF CANNED TUNA AND TUNA-LIKE FISH (IN OIL AND IN BRINE)
CUMULATIVE DATA
5 MOS. 1956 - 20.6
5 " 1955 - 19.5
12 " 1955 - 50.8
CANNED SARDINES (IN OIL AND NOT IN OIL)
CUMULATIVE DATA
5 MOS. 1956 - 8.5
5 " 1955 - 8.6
12 " 1955 - 21.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
MDL - MARKET DEVELOPMENT LISTS.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
FL - FISHERY LEAFLETS.
SSR. - FISH.- SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1281 - New York Landings, 1955 Annual Summary, 9 pp.
CFS-1298 - Maine Landings, 1955 Annual Summary (by County and Gear), 10 pp.
CFS-1309 - Maine Landings, 1955 Annual Summary (by Months), 10 pp.
CFS-1312 - Massachusetts Landings, 1955 Annual Summary (by Ports), 16 pp.
CFS-1313 - Alaska Fisheries, 1955 Annual Summary, 6 pp.
CFS-1314 - Fish Meal & Oil, Mar. 1956, 2 pp.
CFS-1316 - Rhode Island Landings, 1955 Annual Summary, 6 pp.
CFS-1318 - New York Landings, Feb. 1956, 4 pp.
CFS-1323 - California Landings, Jan. 1956, 4 pp.
CFS-1324 - Florida Landings, Jan. 1956, 6 pp.
CFS-1325 - New Jersey Landings, Mar. 1956, 3 pp.
CFS-1326 - North Carolina Landings, Mar. 1956, 2 pp.
CFS-1327 - Georgia Landings, Mar. 1956, 2 pp.
CFS-1328 - Frozen Fish Report, April 1956, 8 pp.
CFS-1329 - Texas Landings, Mar. 1956, 3 pp.
CFS-1330 - New York Landings, Mar. 1956, 4 pp.
CFS-1331 - Florida Landings, 1955 Annual Summary, 10 pp.
CFS-1333 - Rhode Island Landings, Mar. 1956, 3 pp.
CFS-1335 - Middle Atlantic Fisheries, 1954 Annual Summary, 5 pp.
CFS-1336 - Florida Landings, Feb. 1956, 6 pp.
CFS-1338 - Fish Meal & Oil, 1955 Annual Summary, 4 pp.
CFS-1341 - California Landings, Feb. 1956, 4 pp.
CFS-1342 - Alabama Landings, Mar. 1956, 2 pp.
CFS-1343 - Ohio Landings, April 1956, 2 pp.
CFS-1344 - New England Fisheries, 1954 Annual Summary, 7 pp.
CFS-1345 - Fish Meal & Oil, April 1956, 2 pp.
CFS-1346 - Texas Landings, April 1956, 4 pp.
CFS-1347 - New Jersey Landings, Apr. 1956, 4 pp.
CFS-1348 - Georgia Landings, April 1956, 2 pp.
CFS-1351 - North Carolina Landings, Apr. 1956 3 pp.
CFS-1352 - New York Landings, April 1956, 4 pp.
CFS-1353 - Rhode Island Landings, Apr. 1956, 3 pp.
CFS-1354 - Maine Landings, April 1956, 3 pp.
CFS-1355 - Mississippi Landings, Apr. 1956, 2 pp.
CFS-1356 - Alabama Landings, Apr. 1956, 2 pp.

MDL- 2 - Michigan Locker Plants, Apr. 1956, 8 pp.
MDL- 3 - Tennessee Locker Plants, May 1956, 4 pp.
MDL- 8 - Montana Locker Plants, Apr. 1956, 7 pp.
MDL- 9 - Oklahoma Locker Plants, May 1956, 8 pp.
MDL-12 - Texas Locker Plants, May 1956, 17 pp.
MDL-13 - New York Locker Plants, May 1956, 7 pp.
MDL-16 - N. Dak. Locker Plants, May 1956, 7 pp.
MDL-19 - Washington Locker Plants, May 1956, 14 pp.
MDL-21 - New Jersey Locker Plants, May 1956, 3 pp.
MDL-23 - Rhode Island Locker Plants, May 1956, 1 p.
MDL-24 - Ohio Locker Plants, May 1956, 11 pp.
MDL-26 - Colorado Locker Plants, May 1956, 6 pp.
MDL-28 - Vermont Locker Plants, May 1956, 2 pp.
MDL-29 - Virginia Locker Plants, 4 pp.
MDL-30 - North Carolina Locker Plants, May 1956, 5 pp.
MDL-31 - Oregon Locker Plants, May 1956, 11 pp.
MDL-34 - Missouri Locker Plants, May 1956, 15 pp.
MDL-43 - South Carolina Locker Plants, May 1956 3 pp.
MDL-44 - South Dakota Locker Plants, May 1956, 8 pp.
MDL-45 - Utah Locker Plants, May 1956, 4 pp.
MDL-46 - West Virginia Locker Plants, May 1956, 2 pp.

SL - 6 - Wholesale Dealers in Fishery Products, New York Coastal Area, 1955, 6 pp.

FL-426 - Household Consumer Preferences for Breaded Shrimp & Breaded Fish Sticks. Part 3--Summary by Income Groups, Household Size, Homemaker Age Groups, and Occupation, 155 pp., illus., processed, Feb. 1956.
FL-429 - Factors to be Considered in the Freezing and Cold Storage of Fishery Products, 66 pp. (Part 3).
FL-430 - Refrigeration of Fish, 125 pp. (Part 4).

SSR-Fish. No. 164 - Mid-Pacific Oceanography, Part VII, Hawaiian Offshore Waters, September 1952-August 1953, by Gunter R. Seckel; 257 pp., illus., processed, November 1955.

SSR-Fish. No. 170 - Use of Infrared Radiation in the Study of Fish Behavior, by Rea E. Duncan, 20 pp., illus., processed, March 1956.

SSR-Fish. No. 171 - January to April Distribution of the Common Shrimp on the South Atlantic Continental Shelf, by William W. Anderson, 17 pp., illus., processed, April 1956.

SSR-Fish. No. 172 - Effect of Sound Waves on Young Salmon, by Harvey L. Moore and

H. William Newman, 22 pp., illus., processed, April 1956.

Sep. No. 441 - Composition of Southern Oysters.
Sep. No. 442 - Exploratory Fishing Vessel George M. Bowers: Part I - Description of Vessel, Part II - Vessel's Electrical and Auxiliary-Drive Systems.
Sep. No. 443 - Research in Service Laboratories (July 1956): Contains these short articles--"Storage Tests on Frozen Fried Fish Sticks Prepared from Pacific Cod," "Effect of Raw Material on Tuna-Meal Quality," "Research Programs Discussed at Pacific Fisheries Technologists Conference," "Progress in Research on Southern Oysters," "New Techniques for Freezing and Storing North Atlantic Lobsters."

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Fishery Statistics of the United States 1953, by A. W. Anderson and E. A. Power, Statistical Digest No. 36, 340 pp., illus., printed, $1.50, 1956. This is the latest in a series of annual statistical reports on the fisheries of the United States, Alaska, and Hawaii, which contains data on the catch and ex-vessel value of fishery products, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the production and value of manufactured fishery products and byproducts. The statistical surveys conducted during 1954 for 1953 data were conducted in all sections of the United States except in the Mississippi River States which were last canvassed in 1950. The total catch of fishery products totaled 4,467,960,000 pounds, valued at $352,275,000 ex-vessel--an increase of 1 percent in quantity as compared with 1952. Had there not been a spectacular gain in the production of menhaden during the year, the catch would have been far below that of 1952. Menhaden production off the Atlantic and Gulf States during 1953 again broke all records with the catch of this item soaring to nearly 1.7 billion pounds. This was a gain of over 312 million pounds above the production of the previous year and the largest catch of this species in history. Shrimp was again the most valuable single item taken by domestic fishermen. The catch of these shellfish totaled a record 260 million pounds valued at nearly $77 million ex-vessel, the highest annual value ever recorded in a United States fishery. Major fisheries recording noticeable production decreases during 1953 were ocean perch, salmon, tuna, sea herring, Pacific sardines, mackerel, and oysters. Price disputes in several of the more productive New England ports contributed greatly to the marked decline in the ocean perch fishery. The noticeable drop in Alaska salmon production during 1953 was of great concern to packers and conservationists alike. The one bright spot in the otherwise dismal salmon picture was the 23-million-pound rise in salmon production in the Pacific Coast States during the year. The 1953 Pacific sardine fishery in California was even a more dismal failure than the 1952 season since a total of only 9 million pounds were taken during the year compared with 14 million pounds reported in this fishery during the previous year. The Pacific Coast mackerel fishery also continued its steady decline with the catch of this item amounting to less than 8 million pounds compared with nearly 21 million pounds in 1952. However, the 86-million-pound catch of anchovies in California was the largest in history. The pack of canned fishery products in the United States, Alaska, Hawaii, and Puerto Rico in 1953 amounted to 792 million pounds valued at nearly $307 million to the packers--a decrease of 3 percent in quantity but an increase of less than one percent in value compared with 1952. Sharply reduced packs of salmon and Pacific Coast sardines were largely responsible for the volume of the pack total falling below that of several recent years; however, record packs of tuna and anchovies were canned during the year. The production of fishery byproducts in the United States and Alaska during 1953 was valued at over $74 million--9 percent more than the value for 1952. Lewes, Del., was the nation's leading fishing port poundagewise during 1953, with receipts of approximately 363 million pounds consisting almost entirely of menhaden. San Pedro, Calif., was in second place with 329 million pounds, mostly tuna, followed by Port Monmouth, N. J., with 198 million pounds of fishery products, comprised mostly of menhaden. Fishery statistics of the United States and Alaska are compiled and published annually to make available information on both the economic and biological aspects of the domestic commercial fisheries. Data on the economic aspects are necessary to persons engaged in the commercial fishery and to governmental agencies concerned with its regulation and protection. From the biological standpoint, these data are important to sound fishery management in providing detailed information on fluctuations in the commercial catch by species, locality, gear, and on the type of gear and craft operated. They assist conservation agencies in regulating the commercial fisheries so as to produce maximum yields without depletion.

Laws and Regulations for Protection of the Commercial Fisheries of Alaska, 1956, Regulatory Announcement 48, 79 pp., printed, April 1956, 25 cents. This publication is divided into two sections. One section contains laws for the protection of the commercial fisheries of Alaska and related information, including the authority for regulation, rules regarding oyster culture, Bristol Bay residence requirements, regulation of salmon escapement, fishing-gear restrictions, exceptions to weekly closed seasons, etc. The second section contains all the regulations for the protection of the commercial fisheries of Alaska amended to date and which became effective April 21, 1956. These 1956 regulations supersede the regulations published in Regulatory Announcement 45 which became effective February 19, 1955.

Method of Evaluating Temperature in Lakes with Description of Thermal Characteristics of Convict Lake, California, by Norman Reimers and Bobby D. Combs, Fishery Bulletin 105 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 22 pp., illus., printed, 20 cents, 1956.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED IN THE REVIEW.

California Fishery Products Monthly Summary, April 1956, 10 pp.; California Fishery Products Monthly Summary, May 1956, 10 pp. (Market News Service, U. S. Fish and Wildlife Service,

Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, and squid; pack of canned tuna, mackerel, herring, anchovies, and squid; market fish receipts at San Pedro.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, April 1956, 5 pp., Gulf Monthly Landings, Production, and Shipments of Fishery Products, May 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

(New York) Monthly Summary - April 1956 - Receipts of Fishery Products at the New York City Wholesale Salt-Water Market, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Fishery production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, May 1956, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers.

(Chicago) April 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

"Oyster Bulletins," processed. (Available free from the Fishery Biological Laboratory, U. S. Fish and Wildlife Service, Milford, Conn.) As in previous years, a series of bulletins are issued during the summer with information of practical importance and interest to the oyster growers of Long Island Sound. These bulletins describe the progress of accumulation and quantity of spawn in oysters during the prespawning and spawning periods, report on the intensity of spawning of the oyster population at different depths of Long Island Sound, and report on the beginning and intensity of setting in different sections of Long Island Sound. Also included is information on the survival and rate of growth of recently set oysters, growth of oysters with damaged shell edges, and other facts that may be of interest to oyster culturists. The bulletins are titled: "Observations on Gonad Development, Spawning and Setting of Oysters and Starfish in Long Island Sound."

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

Actividades Pesqueras en la Republica Argentina y Posibilidades de Incrementar el Consumo de Pescado (Fishery Activities in the Argentine Republic and Possibilities for Increasing the Consumption of Fish), by Carlos Gonzalez, Publicacion Miscelanea no. 415, 43 pp., illus., printed in Spanish. Ministerio de Agricultura y Ganaderia, Departmento de Investigaciones Pesqueras, Buenos Aires, Argentina, 1956.

Artes y Metodos de Pesca (Primer Curso) (Fishing Techniques and Methods--First Course), by Jose A. Suarez Caabro, 115 pp., illus., printed. Academia Nacional de Patrones, Marina de Guerra, Havana, Cuba, 1955. Discusses oceanography, plankton, fish concentrations, locating fish, various types of fishing, and other information of value to fishermen.

"The Battle of the Bergs," by Jesse C. Burt, article, Natural History, vol. LXV, no. 4, April 1956, pp. 186-191, illus., printed, single copy 50¢. American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. An interesting article about the icebergs of the North Atlantic which are a menace to the fishermen of the Grand Banks of Newfoundland who fish for cod and haddock. The International Ice Patrol has made the sea lanes safe; now scientists are weighing the practicality of towing large bergs to the rescue of drought-stricken areas.

"Biology of the Red Salmon, Oncorhynchus nerka (Walbaum) of Bristol Bay, Alaska, as Revealed by a Study of Their Scales," by Ted. Swei-yen Koo, p. 1681, printed. Dissertation Abstracts, vol. 15, no. 9, Univ. Microfilms, Ann Arbor, Mich., 1955.

"Boston Firm Uses Fermented Fish in New Soil Fertilizer," by J. Bunker, article, Maine Coast Fisherman, vol. 7, no. 6, January 1953, p. 8, printed. Maine Coast Fisherman, Journal Bldg., Belfast, Me.

A Check List of the Fishes of Iowa with Keys for Identification, by Reeve M. Bailey, 52 pp., illus., printed. (Reprinted from Iowa Fish and Fishing, 1951, pp. 187-237.) Iowa State Conservation Commission, Des Moines, Iowa. A revised check list of fishes of Iowa with keys for identification which are also revised. This list comprises 25 families, 61 genera, 133 species, and 137 total kinds, including subspecies, of native fishes. In addition, four exotic species (brown trout, rainbow trout, carp, and goldfish) have become established and are included in the list.

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"Coagulating Agents for Use in Herring Reduction: Calcium Chloride-Formalin," article, Meldinger fra SSF, no. 6, October 1951, p. 117, printed in Norwegian. Sildolje-og Sildemelindustriens Forskingsinstitut, Bergen, Norway.

"A Comparison of Alternating and Direct Electric Currents in Fishery Work," by Dwight A. Webster, John L. Forney, Robert H. Gibbs, Jr., Jack H. Severns, and William F. Van Woert, article, New York Fish and Game Journal, vol. 2, no. 1, January 1955, pp. 106-113, printed. Conservation Department, Broadway Arcade Bldg., Albany, N. Y.

The Conservation Yearbook 1955-1956, edited by Erle Kauffman, 306 pp., illus., printed, $7.50. Cornwell, Inc., 1025 Connecticut Ave. NW., Washington 6, D. C. A directory and guide to the conservation of renewable natural resources (including fisheries) and to the conservation agencies and organizations.

Contribution to the History of Fishing in the Southern Seas, by Bengt Anell, Studia Ethnographica Upsaliensia IX, 249 pp., illus., printed, £5 (US$14). Almqvist & Wiksell, Stockholm, Sweden, 1955. The first part of this work deals with the following tackle: thorn-lined trap, plunge-basket, casting net, fishing kite, pole snare, shark snare, and harpoon. As regards their distribution and possible origin they may be divided into two groups, one of which consists of implements characteristic for the tropical areas, and in Oceania chiefly to be found in Melanesia; the other group includes implements which in Oceania are mainly recorded from Polynesia and Micronesia, and which outside Oceania are known chiefly from the northern regions. The author states in the introduction that "The main principle has been to choose a number of fishing implements, the distribution and use of which could be regarded as interesting from an ethnographical point of view. Less attention has been paid to their purely economic importance. Further, it was of particular interest to study the Oceanic distribution of some implements, the occurrence of which in other parts of the world has already been accounted for, e. g. the casting net and the plunge-basket. It is quite obvious that an investigation of the present kind is intended to contribute at the same time, in some measure, to the solution of the current problems of Oceanic ethnography. Although the largest part of the present work deals with the fishing of Oceania, I have also investigated, to a certain degree, the extra-Oceanic distribution of the fishing tackle in question. In this respect special attention has been devoted to the regions along the shores of the Pacific and Indian Oceans. In order to reconstruct the probable diffusion of the Oceanic implements, it is necessary to fit them into a wider context. In doing so it may be possible to realize what is characteristic of Oceanic fishing and what may be ascribed to alien influence. One may also be able to localize the parts of the world from where the main influences emanate and study the evolutionary tendencies. The brief surveys made here are by no means exhaustive and undoubtedly there exists a richer material."

Creatures of the Deep Sea, by Klaus Gunther and Kurt Deckert, translated by E. W. Dickes, 222 pp., illus., printed, $3.95. Chas. Scribner's Sons, 597-599 5th Ave., New York 17, N. Y.

Dehydration of Fish, by C. L. Cutting and G. A. Reay, with a chapter by J. M. Shewan, Food Investigation Special Report No. 62, 175 pp., illus., printed, 7s. 6d. net (US$1.04). Department of Scientific and Industrial Research (Available from Her Majesty's Stationery Office, London, England, 1956). This report describes in detail the various attempts that were made and the development to a commercial scale of a dehydration process for drying minced cooked herring and white fish in warm air. The experiments were carried out on a pilot-plant scale by the Torry Research Station of the Department of Industrial and Scientific Research and the Ministry of Food. It includes discussions on the preliminary examination of various methods of drying; warm-air drying of minced cooked fish--development of the experimental dehydration process and products; commercial-scale dehydration of fish; physical data for dehydrated fish; density, food equivalent, transport requirements, and compression of dehydrated fish; storage properties of dehydrated fish; reconstitution and utilization; bacteriology of dehydrated fish in production and use; factors affecting the cost of dehydrated fish; and the future of fish dehydration.

(East Pakistan) Fishing Craft of East Pakistan, by Nazir Ahmad, 9 pp., illus., printed. Directorate of Fisheries, Government of East Bengal, Dacca, East Bengal, 1955. Describes and illustrates the different kinds of fishing boats used in East Pakistan. These craft differ in length, breadth, depth, and other details from district to district, but have one common characteristic and that is that all of them are of light build and highly buoyant. An attempt is made to classify them by taking into consideration the gear used by them as well as their shape, etc.

"Effects of Rapid Direct Current Pulsations on Fish," by David C. Haskell and William J. Adelman, article, New York Fish and Game Journal, vol. 2, no. 1, January 1955, pp. 95-105, printed. Conservation Department, Broadway Arcade Bldg., Albany, N. Y.

Effect of Some New Insecticides on Fish and Wildlife, by James R. Fielding and William P. Baldwin, 16 pp., printed. (Reprinted from the 1955 Pesticide Handbook.) The N. C. Agricultural Extension Service, University of North Carolina, Chapel Hill, N. C., 1955.

"An Electric Trawl," by David C. Haskell, Donald Geduldig and Edward Snoek, article, New York Fish and Game Journal, vol. 2, no. 1, January 1955, pp. 120-125, printed, single copy 75 cents. New York Fish and Game Journal, New York Conservation Dept., Albany, N. Y. Various problems encountered in attempting to develop an electric trawl for deep water are discussed. A method involving two pairs of electrodes operated by portable alternating current generators proved successful in collecting warm-water species.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

Enquete Generale sur les Positions Statistiques des Usines Francaises de Conserves de Poissons des Cotes de la Manche et de l'Ocean au Cours de L'Annee 1954 (General Review of the Statistical Position of French Fish Canners for 1954), 8 pp., printed in French. Federation Nationale des Syndicats Francais de Conserveurs des Produits de la Mer, Paris, France. Packs and raw fish received for sardines, tuna, mackerel, herring, anchovies and sprats, and other canned fish and shellfish. Includes amount of raw materials used, number of employees, salaries, and other data.

Estatistica Brasileira da Pesca, 1950-54 (Statistics on Brazil's Fishing Industry, 1950-54), 23 pp., processed. Servico de Estatistica da Producao, Ministerio da Agricultura, Rio de Janeiro, Brazil, 1954.

Farm Fish Ponds in New Zealand, Fisheries Lab. Publ. No. 23, 6 pp., printed. New Zealand Marine Department, Wellington, New Zealand, 1954.

"Farm Ponds for Food and Fun," by James V. Stoddard, article, Wyoming Wildlife, vol. 19, no. 8, August 1955, pp. 22-26, printed. Wyoming Game and Fish Commission, Box 378, Cheyenne, Wyo.

The First Book of Sea Shells, by Betty Cabanna, 39 pp., illus., printed, $1.95. Franklin Watts, Inc., 699 Madison, New York 2, N. Y., 1955.

"Fish By-Products," article, D.S.I.R. Food Investigation Report for the Year 1952, p. 36, printed. H.M.S.O., York House, Kingsway, London, W. C. 2, England, 1953.

Fisheries Research Papers, vol. 1, no. 4, March 1956, 79 pp., illus., printed. Washington Department of Fisheries, 4015 20th Avenue West, Seattle 99, Wash. Contains the following articles: "A Comparison of Otoliths and Interopercular Bones as Age Indicators of English Sole," by Arthur T. Palmen; "Migratory Habits of Pink Salmon in the Tacoma Narrows Area of Puget Sound," by Hans M. Jensen; "Retention of Pacific Oyster Larvae in an Inlet with Stratified Waters," by Ronald E. Westley; "Recoveries of Immature Chum Salmon Tagged in Southern Puget Sound," by Hans M. Jensen; "A Proposed Correction of Migratory Fish Problems at Box Culverts," by W. R. McKinley and R. D. Webb; "Tests on Hauling as a Means of Reducing Downstream Migrant Salmon Mortalities on the Columbia River," by C. H. Ellis; "Introduction of a Japanese Alga, Sargassum muticum, into the Northeast Pacific," by Robert F. Scagel; "An Appraisal of the Fish Ticket System in Respect to the Washington Otter Trawl Fishery," by Dayton L. Alverson; and "New Tattooing Devices for Marking Juvenile Salmon," by William A. Dunstan and Wallace E. Bostick.

Fishery Cooperatives in Canada, by Rafael Mora Rubio, 28 pp., illus., processed. Cooperatives Section, Division of Labour and Social Affairs, Department of Economic and Social Affairs, Pan-American Union, Washington, D. C. Presents a study which analyzes important aspects of technical, economic, and financial problems of fishery cooperatives in the Canadian Provinces of Nova Scotia and Quebec. The problems of plant and equipment, scientific investigation, and education and training of fishermen are the three principal points of interest discussed under the technical problems which confront fishermen's cooperatives in Quebec and Nova Scotia. In the section on economic problems are discussions on income and markets which are both very important in the correct planning of a fishery cooperative. The financial problems, which are the most chronic and acute, begin with the organization of the cooperative. These problems are discussed, and the general opinion is that they can be avoided or minimized by means of sound economic and financial planning.

"Fish Handling and Processing in Europe--Fish By-Products," by W. A. Empey, article, Fisheries Newsletter, vol. 12, no. 6, June 1953, p. 11, printed. Fisheries Newsletter, Box 2595, G.P.O. Sydney, Australia.

(FAO) Sampling Technique for Estimating the Catch of Sea Fish in India, by P. V. Sukhatme, V. G. Panse, and K. V. Sastry, FAO Rept. 55/6/3791, 26 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1955.

(FAO) "Technical Service Assists World's Underdeveloped Fisheries," article, The South African Shipping News and Fishing Industry Review, vol. XI, no. 4, April 1956, pp. 61 and 63 illus., printed. Odhams Press, South Africa (Pty.) Ltd., P. O. Box 2598, Cape Town, South Africa. Under the heading of technical assistance the Food and Agriculture Organization of the United Nations is helping to boost the productivity of thousands of fishermen in underdeveloped fisheries throughout the world. This article describes the growth of the technical assistance work of FAO's Fisheries Division and how it covers activities in all phases of fisheries. In 1950 funds were made available to extend and intensify technical assistance in modernizing the fisheries of underdeveloped countries, and since then projects in this field have been conducted in more than 30 countries.

Guide for Sport Fishermen, 1956-1957 Local Fishing Guide, illus., printed, 50 cents for each booklet. Foster Publications, Inc., 165 Broadway, New York, N. Y. A series of booklets providing complete information for the following group of states on when, where, and how to fish in local waters: (1) Pacific Salt Water Annual; (2) Florida-Gulf States Annual; (3) Pacific Fresh Water Annual; (4) Eastern Salt Water Annual; (5) Eastern Fresh Water Annual; (6) Great Lakes States-Canadian Annual.

The Hardshell Clam Fishery of Maryland Waters, by F. W. Sieling, 1 p., illus., printed. (Reprinted from Maryland Tidewater News, vol. 12, no. 10, supplement no. 9, March 1956.) Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

Important Potomac River Fishes Recorded from Marine and Fresh Waters Between Point Lookout, St. Mary's County, and Little Falls, Montgomery County, Maryland, with a Bibliography to Potomac Fisheries, by Romeo Mansueti, 12 pp., processed. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., January 1955. A list of the important Potomac River fishes with general notations of habitat, movements, time of occurrence, spawning, rate of abundance, average size, whether or not covered by Maryland law, and whether introduced or native. Also contains a list of the most important references on the Potomac River fisheries giving information on the kinds of fish, their distribution, life history, ecology, and economic value.

Import Tariff System of the Philippines, World Trade Information Service Operations Report no. 56-32, Part 2, 4 pp., printed, 10 cents. U. S. Department of Commerce, Washington 25, D. C.

(India) Annual Report of the Department of Fisheries, Bombay State, for the Year 1954-55, 71 pp., illus., printed. Government Book Depot, Charni Road Gardens, Bombay 4, India, 1956. Reports on the marine fisheries, fish-curing yards, fisheries schools, fresh-water fisheries, technological studies, and socio-economic work. Statistics are also included on the different varieties and quantities of fish landed in 1954-55.

Informe sobre las Explotaciones Camaroneras de los Estados Unidos Mexicanos, dedicado al H. Presidente de la Republica Don Adolfo Ruiz Cortines (Notes on the Exploitation of Shrimp in the United States of Mexico, Dedicated to the President of the Republic, Don Adolfo Ruiz Cortines), Boletin Informativo, vol. XV, no. 3 February 1955, 24 pp., illus., printed in Spanish. Centro de Estudios Pesqueros de las Industrias Mexicanas, S. C., Mexico, D. F.

(ICA) Operations Report, December 31, 1955, FY 1956, Issue No. 2, 65 pp., illus., processed. Office of Statistics and Reports, International Cooperation Administration, Washington 25, D. C.

An Introduction to Echosounding, 126 pp., illus., printed. Elac-Electroacustic G.m.b.H., Kiel, Germany, 1955. For more than a quarter century, the echo-sounder has been an indispensible aid to navigators. Its ability to supply depth measurements in practically all weather without impeding the crew's activities gives it a distinct advantage over the earlier lead-line sounding technique. This particular feature has made it invaluable for finding the ship's position and has reduced the risk involved in maneuvering near coastal and shoal waters. With echosounders, trawlers can fish along shelving coasts and banks once considered too dangerous for their operation. Due to improvements and innovations in the equipment, echo-sounders now are able to find fish. The advantages this brings to the fishing trade are obvious. Nets need no longer be shot haphazard because the new method makes it possible to detect fish more rapidly and with less trouble than by test catches. In ground net trawling, these modern "fish-finding sounders" are further useful in that they enable the skipper to steer clear of wrecks or rocks which would tear his net. They also facilitate estimating during trawling how full a net may be. Mid-water trawling has been made possible for the first time through the invention of fish-finding sounders. Without them, nets could not be lowered with any degree of certainty to the level above the seabed where a shoal of fish is located. This booklet discusses in considerable detail the meaning of sound, the use of ultrasound, sounding technique and sounder principles, factors limiting accuracy of measurement, sounding technique, graph indication, interpretation of indications, and indications of fish.

"Introduction of Edible Pond Fish from Philippines," by H. Van Pel, article, SPC Quarterly Bulletin, vol. 6, no. 1, January 1956, p. 17, illus., printed. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Fingerlings of three species of edible pond fish, taken from nurseries in Manila, were flown to New Caledonia in October 1955 to stock experimental fish-breeding ponds there. This article describes the operation.

"Investigation & Management of the Atlantic Salmon in 1955," article, Trade News, vol. 8, no. 10, April 1956, pp. 3-16, illus., printed. Department of Fisheries of Canada, Ottawa, Canada. Includes two articles which review the progress made in 1955 on the research and management program aimed at increasing Canada's Atlantic salmon resources. The first article, dealing with the research program, is by Dr. C. J. Kerswill of the Fisheries Research Board of Canada's Biological Station at St. Andrews, N. B., and the second article, dealing with the management program is by Dr. W. M. Sprules of the Conservation and Development Service, Department of Fisheries, Ottawa. An attempt is made to show the purpose of each activity, and the significance of both the additions to knowledge through investigation and the accomplishments through management activities.

"The Isolation from Shark (Galeorhinus australis) Liver Oil of a Multi-Branched C_{18} Saturated Fatty Acid Fraction," by Isobel M. Morice and F. B. Shorland, article, Chemistry and Industry, 1952, pp. 1267-1268. (Reprints are available from the New Zealand Scientific Liaison Office, Room 409, 1907 K St. NW., Washington 6, D. C.)

(Japan) Tokai Regional Fisheries Research Laboratory, Special Publication No. 5, 27 pp., illus., printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Contains the following articles by Zinziro Nakai: "The Recent Sea Fisheries in Japan and their Resources;" "Recent Trends in Planktonological Researches in Japan;" and "The Chemical Composition, Volume, Weight, and Size of the Important Marine Plankton."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

Key to the Fresh Water Fishes of Texas, by Clark Hubbs, 30 pp., processed. Texas Fish and Game Commission, Austin, Tex., 1955.

"La Pesca del Atun en las Costas de Africa" (Tuna Fishery off the Coasts of Africa), by E. P. Postel, article, Puntal, vol. III, no. 24, March 1956, pp. 8-10, illus., printed in Spanish, 10 pesetas (US$0.04). Puntal, Alicante, Spain.

La Pesca del Atun, y sus Posibilidades en el Golfo de Mexico (The Tuna Fishery and Its Possibilities in the Gulf of Mexico), by Jorge Carranza, no. 11, 33 pp., illus., printed in Mexican. Instituto Mexicano de Recursos Naturales Renovables, A. C., Mexico, D. F., Mexico.

"Liquid Fertilizers Lead in New Applications of Fish By-Products," article, Journal of Agricultural and Food Chemistry, vol. 1, no. 3, April 1953, pp. 206, 229, printed. Journal of Agricultural and Food Chemistry, 20th and Northampton Sts., Easton, Pa.

A Manual Piston Coring Device for Use in Shallow Water, by Robert N. Ginsburg and R. Michael Lloyd, 4 pp., illus., printed. (Reprinted from the Journal of Sedimentary Petrology, vol. 26, no. 1, March 1956, pp. 64-66) The Marine Laboratory, University of Miami, Coral Gables, Fla.

Meddelelser fra Danmarks Fiskeri-og Havundersøgelser (Reports from Denmark's Fishery and Ocean Research), Ny Serie, vol. 1, nos 2-8, illus., printed in English with summaries in Danish, 15 Kr. (US$2.17). Danmarks Fiskeri-og Havundersøgelser, Charlottenlund Slot, Denmark, 1954. Contains the following reports: No. 2--"On the Quantities of Macroplankton in the North Atlantic," by P. Jespersen, 12 pp.; No. 3--"Is there any Correlation Between Metabolism and Number of Vertebrae (and Other Meristic Characters) in the Sea Trout (Salmo trutta trutta L.)?" by Knud Marckmann, 9 pp.; No. 4--"Foul Taste of Fish and Oysters Caused by Chlorophenol," by Jan Boetius, 8 pp.; No. 5--"On the Life History of Halibut in Faroe Waters," by J. S. Joensen, 25 pp.; No. 6--"Electrofishing of Sea Trout for Stripping," by Knud Larsen, 12 pp.; No. 7--"Efficiency of Marine Bottom Samplers of the van Veen and Petersen Types," by Erik Ursin, 8 pp.; and No. 8--"Planktological Contributions I," by Jul. Grontved, 7 pp.

"A Method for Removing the Effect of Recruitment on Petersen-Type Population Estimates," by Richard A. Parker, article, Journal of the Fisheries Research Board of Canada, vol. 12, no. 3, May 1955, pp. 447-450, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

My Hobby is Collecting Sea Shells and Coral, by Ruth H. Dudley, 127 pp., illus., printed, $2.95. Hart Publishing Co., Inc., 670 5th Ave., New York 19, N. Y., 1955.

"Nitrogen Secretion in the Swimbladder of Whitefish," by P. F. Scholander, L. van Dam, and Theodore Enns, article, Science, vol. 123, no. 3185, January 13, 1956, pp. 59-60, printed. Science, 1515 Massachusetts Ave. NW., Washington 5, D. C. Results of analyses of swimbladder gas of whitefish are given. The authors state, that "The swimbladder gas in our deepwater coregonid consists of some 99 percent pure nitrogen gas. ... The deposition of nitrogen and argon against considerable concentration gradients in the swimbladder of fishes suggests, in the absence of other explanations, the possibility of a cellular mechanism for the secretion of inert material."

"The Noisy Underwater World," by Joseph Bernstein, article, Natural History, vol. LXV, no. 4, April 1956, pp. 192-195, 224, illus., printed, single copy 50 cents. American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y. This article describes the scientific investigations of the underwater sounds caused by fish and shellfish and the different noises they make. The hydrophone is the basic instrument in the study of underwater sounds. It is nothing more or less than a microphone adapted for underwater use. Like all microphones, it magnifies the sound it picks up. The sound is then fed into an analyzer unit, which separates it into its basic components. The sounds are recorded either on discs or tape. These records can, of course, be played back, so that the various characteristics can be studied in detail and compared with other sounds. Where the noise is a confused jargon, the analyzer serves to separate the individual sounds according to the different octaves. Each pitch-range can then be separately recorded. In this way it is possible to isolate and identify the different noise producers. "Although the natural history of sonic marine animals is barely out of its swaddling clothes as a science," states the author, "many practical applications have already been made, and still more are in the offing. Experts will be able to predict what underwater sounds can be expected in various areas at different seasons, and the operators of the Navy's listening devices can then swiftly screen out biological interference from more ominous noises."

"Notes on the Seaward Migration of Pink and Chum Salmon Fry," by Ferris Neave, article, Journal of the Fisheries Research Board of Canada, vol. 12, no. 3, May 1955, pp. 369-374, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

Nova Scotia Directory of Fish Processors and Packers, 1956, 30 pp., printed. Fisheries Division, Department of Trade and Industry, Halifax, Nova Scotia. This is a directory of producers in Nova Scotia and the products they prepare or pack rather than a directory of dealers and all the products they may have for sale. The names and addresses of the firms are shown as processors and packers of cod and other groundfish, herring, mackerel, alewives, salmon, swordfish, tuna, lobsters, clams, scallops, and producers of liver oil and liver meal and other fishery byproducts.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

On the Methodology of Marine Plankton Collection, with a Suggested Classification, by Z. Nakai, 7 pp., printed. (Reprinted from Symposium on Marine and Fresh-water Plankton in the Indo-Pacific, 1954) Tokai Regional Fisheries Research Laboratory, Tokyo, Japan.

Our Natural Resources--and Their Conservation, by Richard L. Neuberger, pamphlet no. 230, 28 pp., 25 cents. Public Affairs Committee, New York, N. Y., 1956.

Pacific Halibut Fishery Regulations (Effective April 18, 1956), 12 pp., printed; and Memorandum on 1956 Pacific Halibut Fishery Regulations, 7 pp., processed. International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash., April 1956.

Penobscot River Salmon Restoration, by W. H. Everhart, J. E. Watson, and R. E. Cutting, 13 pp., processed. Department of Inland Fisheries and Game, State House, Augusta, Maine, March 1955.

Preliminary Observations on Effects of 1954 DDT Spraying on Miramichi Salmon Stocks, by C. J. Kerswill and P. F. Elson, Progress Reports of the Atlantic Coast Stations, no. 62, July 1955, 43 pp., printed. Fisheries Research Board of Canada, Ottawa, Canada.

"A Procedure for Installation of Fishways at Natural Obstructions," by C. H. Clay, article, The Canadian Fish Culturist, Issue 17, September 1955, pp. 1-12, printed. Department of Fisheries, Information and Educational Service, Ottawa, Canada.

Producao de Conserva, Salga e Oleo de Peixe, 1954 (Production of Canned Fish, Salted Fish, and Fish Oil, 1954), 37 pp., processed. Servico de Estatistica da Producao, Ministerio da Agricultura, Rio de Janeiro, Brazil, 1954.

Production and a Pelagic Fishery, by D. H. Cushing, Fishery Investigations, Series II, vol. XVII, no. 7, 112 pp., printed, $2.25. British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. In every ocean there are large stocks of pelagic species of fish that are only exploited at their fringes. For example, pilchards, or closely related species, extend from the English Channel to the Cape of Good Hope and are fished only at a few points in their distribution. Among such fisheries there has been from time immemorial one for herring in summer in the northern North Sea. Work of previous authors has made it reasonably certain that the major interest of the fish is in feeding on the common copepod Calanus finmarchicus Gunner. In this fishery there seems a fair possibility of reaching an understanding of those factors that govern success or failure and the present paper attempts the first steps towards achievement of that understanding.

Progress Report of the Cooperative IWASHI Resources Investigations, April 1949-December 1951, by Zinziro Nakai, Shuzo Usami, Shigemasa Hattori, Koji Honjo, and Shigeichi Hayashi, 116 pp., illus., printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan, September 1955. In Japan, the commercial name iwashi generally refers to three different species of fish--sardine, Sardinops melanosticta; anchovy, Engraulis japonica; and round herring, Etrumeus micropus. The iwashi holds first place in the total landings of fish belonging to Class Pisces. Being caught in waters all along the coastal areas of the Japanese Islands, these fish play an outstanding role not only in the economy of fishing villages throughout the country but also in the nation's nutritional requirement as a valuable yet readily available source of animal protein. The ultimate objective of the present investigation program is to contribute to the establishment of a conservation policy of the iwashi resource and forecasting prospects of the fisheries. Of the species of fish designated in the present investigation program, emphasis was placed on the sardine, the most important species. In the regions where the anchovies were caught, considerable amount of effort was paid to studies of these fish since they have become a significant item of commercial importance on the Pacific coasts in recent years, while the round herring, whose catch was the least of the three, was treated as a minority. Discussions of the spawning surveys, morphometric surveys, and age composition surveys of catch are presented.

Protokolle zur Fischereitechnik (Journal of Fishery Technology), Heft 16, Bd. 4 (vol. 4, no. 16), 31 pp., illus., processed in German. Institut fur Netz- und Materialforschung, Hamburg 36, Neuer Wall 72, Germany, December 1955.

Report on Additional Studies of Pollution in Biscayne Bay to Federal Security Agency, Public Health Service, National Institutes of Health, under Grant RG-4062 (c2), by J. Kneeland, Progress Report 56-6, 25 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., February 1956.

Report on the British Fishing Industry, Distant Water Trawlers, 1955, 28 pp., illus., printed. The British Trawlers' Federation, Hull, England. A report on Britain's distant-water fleet in 1955 shows that trawling costs rose sharply, fishermen's earnings increased, and yet by greater productivity and higher efficiency the price of fish remained stable. Includes discussions and statistics on landings and prices, imports of foreign-caught fish, fishermen's earnings, vessel and crew losses, capital cost of fleet, and operations at Hull, Grimsby, and Fleetwood.

"The Resistance to Salt Water Corrosion of Various Types of Metal Wire Used in the Tagging of Flatfish," by C. R. Forrester and K. S. Ketchen, article, Journal of the Fisheries Research Board of Canada, vol. 12, no. 1, January 1955, pp. 134-142, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

Revista del Frio (Refrigeration Review), vol. 1, no. 1, January-March 1956, 100 pp., illus., printed in Spanish. Centro Experimental del Frio, Serrano, 150, Madrid, Spain.

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(Scotland) Report on the Fisheries of Scotland, 1955, Scottish Home Department, Cmd. 9739, 72 pp., printed; 3s. (42 U. S. cents). Her Majesty's Stationery Office, Edinburgh, Scotland, April 1956. A report of Scotland's fisheries, with statistical data for the year 1955. Contains total production figures by species and by port (both comparative and historical), and information on the number of boats, personnel, and methods of capture. Production and value of lobsters, crabs, mussels, oysters, and scallops, and fishery byproducts are also included. Sections are also devoted to discussions of the herring, white fish, and salmon fisheries, marine fisheries law enforcement, scientific investigations, and construction and improvement of harbors.

Scottish Sea Fisheries Statistical Tables for 1955, 48 pp., printed, 4s. 6d. net (about 62 U. S. cents). Scottish Home Department (Available from Her Majesty's Stationery Office, Edinburgh, Scotland), April 1956. Statistics on the Scottish fisheries for 1955 are presented. The amount and value of the fish catch by species, by type of vessels, and by districts; utilization of the catch; number and type of fishing vessels by districts; and number of fishermen employed are some of the statistical data included.

Sea Fisheries Research Notes, 1955, Fisheries Notice No. 35, 12 pp., printed. Ministry of Agriculture, Fisheries and Food, Whitehall Place, London, S. W. 1, England, February 1956. Brief news items on fishery research conducted during 1955 by the British Ministry of Agriculture and Fisheries. A list of scientific and other papers issued by the Ministry is included.

"Some Observations on the Movement of Pacific Salmon Fry through a Small Impounded Water Basin," by D. MacKinnon and J. R. Brett, article, Journal of the Fisheries Research Board of Canada, vol. 12, no. 3, May 1955, pp. 362-368, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies Relating to the Validity of the Scale Method for Age Determination of the Northern Anchovy (Engraulis mordax)," by Daniel J. Miller, Fish Bulletin No. 101, pp. 6-34, printed. California Department of Fish and Game, Marine Fisheries Branch, Sacramento 14, Calif., 1955.

"A Study of the Effects of Aureomycin-Containing Sea Water and Ices Upon the Storage Life of Round Herring," by Tetuo Tomiyama, Shunichi Kuroki, Denki Maeda, Seiji Hamada, and Akira Honda, article, Food Technology, vol. 10, no. 5, May 1956, pp. 215-218, printed. The Garrard Press, 119 West Park Ave., Champaign, Ill. Describes a study made of various procedures for treatment with aureomycin of round herring just after being caught. A remarkable prolongation of storage life of round herring resulted from the treatment by either storage in sea water containing ice and aureomycin (10 p.p.m.) on the boat, storage in an aureomycin-containing ice (p.p.m.) after landing, or their combination. A combination of the storage in aureomycin-sea water and holding in aureomycin-ice was found to prolong the storage life approximately 90 percent more than the control without treatment when stored at 15° to 20° C. and in case of storage at -1° to 2° C., at least 40 percent, i.e., a 5-day prolongation in storage life.

A Study of the Fauna of the Brown Shrimp (PENAEUS AZTECUS Ives) Grounds in the Western Gulf of Mexico, by Henry H. Hildebrand, 366 pp., printed. Publ. of the Institute of Marine Science, vol. 3, no. 2, November 1954. Between October 20, 1950, and August 8, 1951, the bottom fauna on the shrimp beds in the western Gulf of Mexico were studied, as sampled by the trawls of the shrimping fleet. Specimens were identified and counted at sea and some were brought ashore for further study. The four major grounds for the brown shrimp and the pink shrimp grounds in the Gulf of Campeche are for the first time delineated and described. The faunal complex or bottom communities on brown shrimp beds are described and have been given community designations in terms of the most abundant animals caught. Additionally, the comparative or relative abundance of all species of fishes and invertebrates on each ground is more extensively discussed and compared with the inshore fauna. Each species taken is discussed individually and various natural history notes, including bathymetric distribution, are given. Data were gathered on quantitative distribution of white and brown shrimp by number and pounds per acre of bottom trawled. It is clear that the brown shrimp do not "school" extensively while the white shrimp do. The range for brown shrimp was 7.3 to 1.1 pounds per acre while the greatest range for white shrimp during a poor season was 5.4 to 1.6 pounds per acre. A breakdown of the number of species caught shows that the greatest numbers were taken at depths of 12 to 25 fathoms rather than at depths of 0 to 12 fathoms.

Survey of the Littoral Zone of York County, Maine, with Respect to Commercial Productivity, by Louis N. Taxiarchis, General Bulletin No. 2, 13 pp., illus., printed. Department of Sea and Shore Fisheries, Augusta, Maine, 1953.

Technical Report of Fishing Boat, No. 8, 182 pp., illus., printed in Japanese with brief English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan, March 1956. Contains the following reports, with very brief abstracts in English, on various studies in progress at the Fishing Boat Laboratory: (1) "Experiment of Controllable Pitch Propeller of the 'Soyo Maru';" (2) "Experimental Results of Model Tests for Wooden Two-boat Trawler;" (3) "Study on the Automatic Net Depth Meter, Automatic Net Length Meter for Salmon Gill Net and the Results of Measurement at Sea;" (4) "Study on the Automatic Net Depth Meter, Net Height Meter for the Crab Tangle Net and its Practical Application;" (5) "Propagation Characteristics of High Frequency Ultrasound

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in Sea Water (Continued);" (6) "Study on Reflection Loss of Ultrasonic Wave on Fish-Body by Millimeter Wave;" (7) "Study on Simplified SONAR of 200 kc Ultrasound and its Field Test;" (8) "Experiment of Fish-Finding at Fishing-Ground of Salmon in the North Pacific Ocean;" and (9) "Study on Application of Echo-Sounder for Fishing-Ground of Crab at the Okhotsk Sea, Western Waters of Kamtchatka Peninsula." An appendix lists the reports published in the past, Nos. 1-7.

Trolling Gear in California, by W. L. Scofield, Fish Bulletin No. 103, 45 pp., illus., printed. Department of Fish and Game, 926 Jay St., Sacramento 14, Calif., 1956. An account of the trolling gear and methods of fishing off the coast of California. Trolling may be conducted from a small boat thereby requiring a low original investment and the gear used is relatively inexpensive compared with netting operations. As a result, this manner of fishing has attracted hundreds of commercial fishermen along the 1,000 miles of California coast. In recent years, commercial men are being outnumbered by the host of sport fishermen, many of whom do trolling at some time during the year. Sport fishermen pioneered ocean trolling in California and have initiated several of the improvements that have been adopted during the 75 years since ocean trolling started in this State. An account, from time to time, of the gear and methods of operating is desirable for each of the important fisheries. Not only may changes be noted, but gear and methods of fishing have a direct bearing when appraising the records of catch per unit of fishing effort in attempts to determine changes in the supply of fish in the ocean. Definitions and descriptions of the various types of gear, histories of salmon and albacore trolling in California, and methods of fishing are among some of the subjects presented.

(Washington) State of Washington Commercial Fishing Statistics, 1955, 47 pp., printed. Washington State Department of Fisheries, Fishermen's Terminal, Seattle 99, Wash. Consists almost entirely of tables showing landings of fish and shellfish in the State of Washington by districts, species, and gear. Comparative data on the catch of most items are shown for the years 1935 through 1955. The report also contains information on the value of landings. Data are shown on the Washington salmon pack from 1900 to 1955, as is information on the United States and British Columbia Fraser River sockeye pack arranged by cycle years from 1900 to 1955. Data on the canned pack of other fish and shellfish and the production of oil and meal are also shown. In addition, the report contains data on the monthly salmon escapement over Bonneville Dam during the years from 1938 to 1955; the number of commercial fishing licenses issued by districts from 1938 to 1955; and a comparative statement of receipts from licenses, taxes, fines, and other sources. Conversion of catch data to the IBM method of computing has resulted in the revision of many production figures published previously in the Commercial Statistics series. Corrections from 1935 to date are contained in the 1955 summary, and the tables in this edition supersede all material previously published.

CORRECTION: On page 23 of the July 1956 issue of Commercial Fisheries Review, one of the authors for the article "New Techniques for Freezing and Storing North Atlantic Lobsters" shown as "Joseph W. Flavin" should have read: "Joseph W. Slavin, Refrigeration Engineer."

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INT.-DUP. SEC., WASH., D.C.2244

CONTENTS (CONTINUED)

	Page
TRENDS AND DEVELOPMENTS (Contd.):	
North Atlantic Herring Research:	
Fish-Finder Soundings by M/V Metacomet Locate Herring (Cruise 2)	37
Fish-Finder Soundings Off Maine and Canada by M/V Metacomet (Cruise 3)	38
North Pacific Exploratory Fishery Program:	
Promising Results with Midwater Trawls by John N. Cobb (Cruise 27)	39
Oregon:	
Trawling Regulations Revised	40
Oysters:	
Regulations Adopted by National Conference of Weights and Measures	40
Pacific Oceanic Fishery Investigations:	
Albacore Tuna Tagged on Japanese Fishing Grounds	41
Hawaii Skipjack Fishing Grounds Survey Completed by Hugh M. Smith (Cruise 34)	42
Skipjack Tuna Behavior in Hawaiian Waters Studied by Charles H. Gilbert (Cruise 28)	43
Second Spring Skipjack Scouting Cruise Completed by John R. Manning (Cruise 31)	44
Public Eating Places Survey:	
Publicizing Beneficial Qualities of Fishery Products Believed Desirable	45
Saltonstall-Kennedy Act Fisheries Projects:	
Shrimp, Sponge, and Tuna Problems Research Contracts Awarded	46
Canned Fish Consumer Purchases Study	47
Foreign Markets for United States Fish Oils Being Studied	47
Fresh Fish Consumption Increase Sought in Inland United States	47
South Atlantic Exploratory Fishery Program:	
More Deep-Water Red Shrimp Explorations by Pelican (Cruise 3)	48
Midwater Trawls and Telemetering Depth Finder Tested by M/V George M. Bowers (Cruise 3)	49
Fishing for Sardinelike Fish off Southern Florida by M/V George M. Bowers (Cruise 4)	50
U.S. Fish Stick Production	50
U.S. Foreign Trade:	
Edible Fishery Products, March 1956	51
Fishery Products Imported from Many Countries	51
Groundfish Fillet Imports Down 10 Percent in June 1956	52
United States Foreign Trade, 1955	53
Washington:	
Fish and Shellfish Landings, 1955	53
Olympia Oyster Industry Endangered by Excessive Mortality	54
Wholesale Prices, June 1956	55
FOREIGN:	57
International:	
International Pacific Halibut Commission:	
First Season in Areas 2 and 1B Closed	57
Food and Agriculture Organization:	
Antibiotics Use and Quality Assessment Highlights Fish-Processing Technologists Meeting	58
Plan for Cutting Costs in Building Fishing Boats	60
International Fishing Gear Congress Planned	61
United States Nominee for Director-General of FAO	62

	Page
FOREIGN (Contd.):	
International (Contd.):	
Whaling:	
Number of Whale Catcher Boats Reduced by Agreement	62
South Pacific Sperm Whale Allotment Proposed	63
Australia:	
Fisheries Development Fund Planned	63
State Cabinet Minister to Visit U. S. Fishing Ports	63
Canada:	
Mandatory Standards for Fish Sticks	64
Large New Research Vessel	65
Denmark:	
Two New Fish Meal Plants in Operation	65
German Federal Republic:	
Trawler Owners to Continue Support of Exports of Frozen Fish	65
Iceland:	
Fish Freezing Plants	66
Japan:	
Japanese-Mexican Fishing Company Planned	66
Producers Form New Frozen Tuna Sales Agency	66
Mexico:	
Fishing-Permit Fees Increased	67
Norway:	
Dried and Salted Fish Export Prospects Revised	68
Cod Catch Heavy This Year	69
Automatic Herring Feeding and Sorting Machine	69
Panama:	
Recent Developments in Fisheries	71
Peru:	
Whaling Activities	74
Union of South Africa:	
Fishing Boats Offered Nylon Propellers	74
U. S. S. R.:	
Fishing Fleets Expanding for Distant-Water Fishing	75
Herring and Carp Caught with Suction Hose	76
Fish Preserved by Electrical Shock	76
United Kingdom:	
Grimsby to Hold Fishing Industry Exhibition	76
Venezuela:	
Tuna Long-Liner Returns to Japan	76
FEDERAL ACTIONS:	78
Department of Agriculture:	
Fish-Stick Standard Established	78
Department of Interior:	
Fish and Wildlife Service:	
Fish and Wildlife Service Reorganization Deferred Pending Congressional Action	81
Notice of Intention to Adopt Amendments to Alaska Commercial Fisheries Regulations	81
Proposed Revised Regulations for New England Haddock Fishery	82
Herring Quota in South-Eastern Alaska Increased	86
High-Seas Fishing for Salmon off Alaska Prohibited	86
Whaling Regulations Revised	89
Eighty-Fourth Congress (Second Session)	92
FISHERY INDICATORS:	95
Chart 1 - Fishery Landings for Selected States	95
Chart 2 - Landings for Selected Fisheries	96
Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products	97

Contents Continued on the Outside Back Cover.

STUDY OF HOUSEHOLD CONSUMER PREFERENCES FOR BREADED SHRIMP AND FISH STICKS

In the third (Fishery Leaflet 426) of a series of reports on household consumer preferences for breaded shrimp and fish sticks, the data from 1,797 questionnaires is summarized by income groups, household size, homemaker age groups, and occupation. The tabulated results from the questionnaires reveal the following facts concerning consumer preference for breaded shrimp and fish sticks:

1. Consumption of breaded shrimp is concentrated among middle and upper income groups.

2. The percentage of households serving breaded shrimp increases moderately in relation to household size.

3. Young housewives buy breaded shrimp much more often than older homemakers. Consumption is higher among white collar occupations than among occupations requiring manual skills.

4. The predominant marketing problem for breaded shrimp is to get consumers to try them. Nine out of ten homemakers trying breaded shrimp become satisfied customers.

5. The consumption of cooked fish sticks is related directly to family income status. Households serving cooked fish sticks during the past year ranged upward from 20 percent for families with less than $2,000 income per year to 50 percent for families with incomes over $10,000. The percentage of households serving fish sticks also increased in relation to household size up to families of five members.

6. Consumption of fish sticks is highest among homemakers under 25 years of age. Thereafter, there is a slightly downward trend for older age groups. Fish-stick consumption is somewhat higher among white-collar occupations than among occupations requiring manual skills.

7. Roughly 60 percent of all American households represents the possible limits of the untapped market for fish sticks. Something like 85 percent of all homemakers buying fish sticks are satisfied with them.

8. About one household in five uses breaded shrimp, either cooked or uncooked. Consumption does vary, however, by family-income status, age of the homemaker, household size, occupation of the breadwinner, and some other factors.

9. Nine out of ten housewives buying breaded shrimp are satisfied with them. The dominant merchandising problem therefore is to get housewives to try breaded shrimp.

10. Most of the large group which had not tried these products gave "No particular reason" as the answer when asked "Why haven't you tried them?" Insofar as the minority gave specific objections, some indicated an aversion for shrimp and others were not familiar with the product or the product was not available in local shopping centers. Significantly, only a very small percentage of those who had not tried breaded shrimp thought them too expensive.

11. When used by homemakers, breaded shrimp does not directly replace other fishery products. For the most part respondents indicated little indirect competition with other fishery products.

12. Housewives are well satisfied with the present package labeling as far as description of the contents is concerned, the manner in which to prepare the shrimp, and suggested recipes. Most housewives prefer medium-breaded shrimp if offered a choice of thin, medium, and heavy breading. They also prefer the largest size shrimp and packaged in layers separated with paper rather than bulk packaging. Housewives prefer light golden-colored cooked shrimp to darker-colored cooked shrimp.

Fishery Leaflet 426 (Household Consumer Preferences for Breaded Shrimp and Breaded Fish Sticks, Part 3 - Summary by Income Groups, Household Size, Homemaker Age Groups, and Occupation) may be obtained free by writing to the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

CONTENTS (CONTINUED)

	Page
FISHERY INDICATORS (Contd.):	
Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers	98
Chart 5 - Fish Meal and Oil Production - U. S. and Alaska	98
Chart 6 - Canned Packs of Selected Fishery Products	99
Chart 7 - U. S. Fishery Products Imports	100
RECENT FISHERY PUBLICATIONS:	101
Fish and Wildlife Service Publications	101
Miscellaneous Publications	103